II. Haystack MLSA and Upper Nile LSR

The Haystack MLSA and Upper Nile LSR were grouped together for assessment purposes due to their adjacent proximity and similar vegetation types.

A. General Description of the LSR and MLSA

1. Vegetation Description

This section describes the current condition of vegetation groups (see Vegetative Landscape section) within the Haystack MLSA and Upper Nile LSR. Data was derived by aerial photo interpretation, stand exam information, and field validation (see Vegetative Landscape section). It should be noted that site specific information regarding vegetation structure and distribution will need to be updated as restoration projects are initiated. The idea would be to use the vegetation layer derived for this analysis as a starting point only. Information is provided below regarding each vegetation group.

a) Dry Forest Group

Sixty-one percent (14,979 acres) of the Haystack MLSA and 7 percent (659 acres) of the Upper Nile LSR consists of the dry forest group. Within this group in the Haystack MLSA, 94 percent (14,122 acres) is mapped as high density and 4 percent (600 acres) as created openings (Appendix 5 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). Within the Upper Nile LSR, 85 percent (558 acres) is mapped as high density and 15 percent (101 acres) as created openings.

In the Haystack MLSA, the Douglas-fir series comprises approximately 15 percent of the dry forest group, with dry grand fir communities supported on the remaining 85 percent of the area. In the Upper Nile LSR, the Douglas-fir series does not occur and the dry forest group is comprised entirely of the dry grand fir plant association. In a few limited sites, ponderosa pine exists as the sole overstory dominate, but more commonly is co-dominant with Douglas-fir and in some locations, grand fir. In the driest associations, shrub understory composition is dominated almost exclusively by *Purshia tridentata* (Naches Mainstem Watershed Assessment 1995). Shrubs such as *Artemisia tridentata, Berberis aquifolium, Arctostaphylos nevadensis,* and *Phlox speciosa* may also occur as subordinate members of these communities. Grasses include *Agropyron spicatum; Calamagrostis rubescens, and Carex geyeri.* Forb composition is represented by *Balsamorhiza caryana, Achillea millefolium, Lupinus sulphureus,* and *Lomatium* spp. (Naches Mainstem Watershed Assessment, 1995).

b) Mesic Sites-

Mesic sites were only mapped on the northern portion of the Wenatchee National Forest. In contrast, on the southern portion of the forest, these mesic sites are replaced by moist grand fir plant associations (see Vegetative Landscape section above). In general, these sites occur on steep (>40% slope), northerly aspects and as stringer riparian areas within the dry forest group. This vegetation will be described in the following section.

c) Moist Grand Fir/Mesic Western Hemlock Vegetation Group

Approximately 27 percent (6,763 acres) of the Haystack MLSA supports moist grand fir or mesic western hemlock plant communities. The majority, or 89 percent (6,009 acres) of this forest group is currently layered and/or mature (mid- to late-successional). Created openings comprise

approximately ten percent (682 acres) of this group (Appendix 5 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). Relative to the Upper Nile LSR, 42 percent (3,841 acres) of the area supports moist grand fir or mesic western hemlock plant associations. Approximately, 2,935 acres (76 percent) is mapped as layered and/or mature. There are 882 acres (23 percent) mapped as created openings in the Upper Nile LSR.

Within this forest group, there is a moisture/temperature gradient which results in development of plant associations from dry, cool conditions adjacent the dry forest group to moist, cool adjacent the subalpine fir series. At the dry end of the moisture gradient, association are dominated in the understory by herbaceous species such as *Calamagrostis rubescens, Festuca occidentalis, Carex concinnoides, Carex geyeri, Arnica latifolia, Lupinus latifolius,* and *Arenaria macrophylla.* Moister associations typically include a shrub component typified by species such as *Spirea betulifolia, Rosa gymnocarpium, Vaccinium* spp., *Symphoricarpos albus, Linnaea borealis, Chimaphila umbellata, Ribes lassiococcus,* and *Pyrola* spp. Forb composition in moister plant associations is lush and includes diverse species including *Achlys triphylla, Clintonia uniflora, Adenocaulon bicolor, Smilacina stellata, Rubus parviflora* and *Trillium ovatum* (Wenatchee National Forest, Ecology Plot Database, and Naches Mainstem Watershed Assessment, 1995).

d) Subalpine Fir Series

The subalpine fir series comprises approximately 22 percent (1,997 acres) of the Upper Nile LSR. This vegetative series is not supported within the Haystack MLSA (Appendix 5 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). In the Upper Nile LSR, the series occurs primarily in the upper elevations in the vicinity of Little Bald and Clover Springs (Appendix 6 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). The majority (74%, 1,477 acres) of this series is mapped as layered and/or mature, and 12 percent (230 acres) as created openings. Thirteen percent (264 acres) of this series is mapped as park-like and one percent (27 acres) as single layered stands (Appendix 5 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas").

Subalpine fir is the most widespread species within the overstory of this series (Wenatchee National Forest, Ecology Plot Database). Common seral dominants include Douglas-fir, lodgepole pine, Engelmann spruce, and western larch. Understory composition is commonly lush with species such as *Valeriana sitchensis, Lupinus polyphyllus, Lupinus latifolius*, and *Calamagrostis rubescens. Arnica latifolia, Carex* spp., and *Luzula hitchcockii* are often dominate herb associates. These communities may be also be shrub dominated with common species such as *Rhododendron albiflorum, Vaccinium myrtillus, Vaccinium membranaceum, Vaccinium scoparium, Rubus lassiococcus, Chimaphila umbellata, Pachistima myrsinites, Pyrola* spp, and *Sorbus sitchensis.* Subordinate community associates may include *Poelmonium pulcherrimum, Pedicularis racemosa,* and *Elymus glaucus.* (Wenatchee National Forest, Ecology Plot Database).

e) Wet Forest Group

This vegetation group only occurs within the Upper Nile LSR, representing 19 percent (1,750 acres) of the area. The majority (96%, 1,686 acres) is mapped as layered and/or matured, while the remaining four percent (64 acres) are created openings. This group occurs primarily in the vicinity of Clover Springs.

In the wet forest group, tree overstory composition is generally dominated by mountain hemlock, Pacific silver fir, and subalpine fir. Subordinate species include lodgepole pine and whitebark pine. Undergrowth composition may vary from relatively lush and dense to scarce. Species representing the shrub component of these communities typically include *Rhododendron albiflorum, Rubus*

lassiococcus, Vaccinium spp., *Ribes viscosissimum, Pyrola* spp., *Lutkea pectinata and Xerophyllum tenax*. Representative herb composition includes *Luzula hitchcockii, Arnica latifolia, Achlys triphylla, Clintonia uniflora,* and *Polemonium pulcherrimum.*

f) Whitebark Pine/Subalpine Larch Group

No whitebark pine or subalpine larch series were mapped within the Haystack MLSA or Upper Nile LSR. However, individual clumps of whitebark pine can be found in the Upper Nile LSR near Clover Springs. Whitebark pine occurs as an early seral dominant in the mountain hemlock on drier sites (see Vegetative Landscape section).

g) Non-Forest Vegetation

There are approximately 2,871 acres (12 percent) of non-forest vegetation in the Haystack MLSA. Included within this group are: bedrock (1,094 acres), talus (862 acres), grassland/shrubland (426 acres), deciduous forest (141 acres), agricultural/residential (131 acres), scree (102 acres), dry meadow (49 acres), water (47 acres), wet meadow (15 acres), and cliff (4 acres).

Relative to the Upper Nile LSR, there are a total of approximately 943 acres (10 percent). Included within this group are: talus (501 acres), grassland/shrubland (369 acres), dry meadow (71 acres), and wet meadow (2 acres). Refer to the Vegetative Landscape section discussion for descriptions of these vegetation types.

h) Species of Special Status

Within the Haystack MLSA and the Upper Nile LSR, there is potentially suitable habitat for a number of species with special status. However, relatively few surveys have been conducted to determine presence or absence. Species with special status surveys should be carried out in conjunction with restoration projects, as well as, independently of other activities. It is important that species ranges are identified so that accurate estimates of species viability can be assessed. In addition, little is known relative to the majority of species with special status habitat and biological requirements, and inventories provide a first and necessary step in obtaining this information.

There are two Forest Service sensitive species within the Haystack MLSA (see Late-Successional Associated Plant Species, Appendix 6 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). *Orobanche pinorum* is known from four independent locations. In general, *O. pinorum* occurs on steep, exposed slopes with loose shallow soils. This species is most closely associated with Douglas-fir and grand fir plant communities. The occurrence of *O. pinorum* is largely dependent on the occurrence of *Holodiscus discolor*, as *O. pinorum* is a parasite on the roots of the *Holodiscus*. *Cypripedium montanum* is also documented to occur in the Haystack MLSA, and is known from two independent locations. Based on it's occurrence on the Naches Ranger district, *C. montanum* appears to favor light disturbance such as low severity fire and light soil disturbance (Engle, personal observation).

There are two Forest Service sensitive species known to occur within the Upper Nile LSR, as well. *Cypripedium montanum* occurs in similar sites as those identified in the Haystack MLSA. *Agoseris elata* has been documented from two individual sites within the Upper Nile LSR. *A. elata* appears to be most closely associated with moist meadows and openings at relatively high elevations.

i) Survey and Manage Species

There are two known survey and manage plant species within the Haystack MLSA; *Cypripedium montanum* (refer to discussion above) and the lichen species *Cyphelium inquinans* which is

documented to occur on ponderosa pine bark. Several additional species are suspected to occur, and the presence or absence of others is simply unknown. The ROD provides standards and guidelines for survey and manage species, and should be referred to for management of these species within the Haystack MLSA.

Although potentially suitable habitat for survey and manage species occurs within the Upper Nile LSR, no species have been documented as of this date.

Table II-1, Sensitive and Survey and Manage Species in Haystack MLSA and Upper Nile LSR

Group	Latin name	Common name	Federal +	State +	Forest Service ++	Presence in Upper Nile **	Presence in Haystack MLSA **
VASCULAR PLANTS	*Agoseris elata*	tall agoseris		S		K	S
VASCULAR PLANTS	*Anemone nuttalliana*	pasqueflower		S		S	U
VASCULAR PLANTS	*Antennaria parvifolia*	Nutall's pussytoes		S		U	S
VASCULAR PLANTS	*Astragalus arrectus*	Palouse milk-vetch		S		U	S
VASCULAR PLANTS	*Carex interrupta*	green-fruited sedge		M3		U	S
VASCULAR PLANTS	*Carex proposita*	smoky mountain sedge		S		S	U
VASCULAR PLANTS	*Carex saxatilis var. major*	russet sedge		S		S	U
VASCULAR PLANTS	*Carex scopulorum var. prionophylla*	saw-leaved sedge		M3		S	U
VASCULAR PLANTS	*Cicuta bulbifera*	bulb-bearing water-hemlock		S		U	S
VASCULAR PLANTS	*Cryptogramma stelleri*	Steller's rockbrake		S		S	S
VASCULAR PLANTS	*Cypripedium montanum*	mountain ladyslipper			SM	K	K
VASCULAR PLANTS	*Githopsis specularioides*	common blue-cup		S		U	S
VASCULAR PLANTS	*Orobanche pinorum*	pine broomrape		S		K	K
VASCULA	*Spirannthes*	western ladies-		S		S	S

Group	Latin name	Common name	Federal +	State +	Forest Service ++	Presence in Upper Nile **	Presence in Haystack MLSA **
R PLANTS	*porrifolia*	tresses					

Key to Columns: **"*" Federal status** - "SP" = Special Protection; **"+" Washington state status** - "S" = Sensitive, "T" = Threatened, "E" = Endangered; **"++" Forest Service designations** - "SM" = Survey and Manage; **"**"** Present (or absent in LSR/MLSA) - "K" = Known, "S" = Suspected

j) Noxious Weeds

Although systematic surveys have not been completed, portions of the Haystack MLSA and Upper Nile LSR have been surveyed for noxious weed species. Documentation of noxious weed species has resulted from roadside surveys (McRae and Harrod unpubl.) and various vegetative reconnaissance. High densities of *Centaurea diffusa* are present along roads, particularly Highway 410. *Linaria dalmatica* is abundant throughout the Haystack MLSA. *Cirsium vulgare* and *C. arvense* are prevalent in areas with relatively recent ground disturbance. *Chrysanthemum leucanthemum, Hypericum perfoliatum, Verbascum thapsus*, and *Convolvulus arvense* occur with relatively low frequency throughout the analysis areas. Survey for species presence and extent should be completed in order to develop a noxious weed management plan for these late-successional reserves (refer to Harrod 1994).

2. Late Succesional Associated Wildlife Species

a) Introduction

In this chapter, information is presented about wildlife species that are associated with the late-successional habitats that are either present or would be managed for in the Haystack MLSA and Upper Nile LSR. A total of 80 species have been identified as being associated with these kinds of forest conditions and are present, unknown or suspected to occur within the MLSA. The list of these species can be found in Appendix 27 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas".

In addition to consideration for the groups of species associated with the various kinds of late-successional forests, individual species assessments were also conducted. These assessments were completed for all threatened, endangered, sensitive, candidate, management indicator, protection and buffer, and survey and manage species. Collectively this group of species is referred to as species of special status. What information is available about the status of these species is summarized in this chapter. However, relatively little is known about a number of them.

Inventories or surveys have been conducted for only a few of the wildlife species as shown in Appendix 27 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas". The most extensive of these were for the northern spotted owl, elk and barred owl. Surveys for these species have been conducted over 100% of their available habitat within the MLSA/LSR.

b) Late Successional Species By Habitat Type

(1) Dry Forests

About 15,638 acres (46%) of Haystack and Upper Nile is composed of the dry forest vegetation group. Fire climax ponderosa pine forests historically dominated these areas and 49 wildlife species are associated with these forests.

Currently, 11,130 acres (71%)of the dry forest is in a successionally advanced condition. About 293 acres (2%) are in a low density condition and could be fire-climax.

Some species that are associated with the late-successional or fire-climax conditions of these forests that have special management status include: tailed frog, larch mountain salamander, northern goshawk, bald eagle, Van Dyke's salamander, flammulated owl, pileated woodpecker, hairy woodpecker, white-headed woodpecker, black-backed woodpecker, Williamson's sapsucker, northern flicker, pygmy nuthatch, elk, long-legged myotis, long-eared myotis, silver haired bat, fringed myotis, western big-eared bat, pallid bat, marten, and fisher.

Historically, only a minor portion of these areas provided the structures that are associated with suitable spotted owl habitat (Thomas et al. 1990, Buchanan et al. 1995). However, fire exclusion has allowed successional advancement for suitable spotted owl habitat to develop in some areas (Agee and Edmunds 1992, Buchanan et al. 1995). These areas are now being used by spotted owls, however the risk of large scale disturbances causing large scale habitat loss is of major concern (Agee and Edmunds 1992, Buchanan et al. 1995, Gaines et al. in press). Six spotted owl activity centers occur in the dry forests. This comprises 60% of the total known spotted owl activity centers within Haystack and Upper Nile.

(2) Mesic Sites Within the Dry Forest

The mesic sites within the Dry Forest group were not mapped. Mesic sites within the dry forests provide important wildlife habitat and add diversity across the landscape. It is suggested that these sites be identified during project level analysis and that the appropriate treatment criteria be applied.

Historically, fire occurred less frequently at these sites (refer to Chapter III) allowing for succession that resulted in more complex forest structure such as a higher canopy closure, multilayering, snags and down logs. These forests occurred in a variety of successional stages across the landscape. The late-successional conditions of these Mesic Forests provide habitat for about 66 wildlife species. The high potential for future fires presents a concern about the sustainability of these forests.

Wildlife species that occur are associated with the late-successional condition of these forests and are of special management status include: tailed frog, Van Dyke's salamander, Cascades frog, larch mountain salamander, northern goshawk, bald eagle, northern spotted owl, great gray owl, flammulated owl, pileated woodpecker, downy woodpecker, hairy woodpecker, white-headed woodpecker, black-backed woodpecker, three-toed woodpecker, red-breasted sapsucker, Williamson's sapsucker, northern flicker, little willow flycatcher, olive-sided flycatcher, chestnut-backed chickadee, pygmy nuthatch, elk, long-legged myotis, long-eared myotis, fringed myotis, Yuma myotis, western big-eared bat, silver-haired bat, pallid bat, marten, and fisher.

These sites are capable of providing habitat structure that typically composes spotted owl foraging and dispersal habitat, while remaining within the historic range of variability.

(3) Moist Grand Fir Group/Mesic Western Hemlock

The Moist Grand Fir/Mesic Western Hemlock group covers about 10,604 acres (31%) of these areas. Historically, fire occurred less frequently than in the Dry and Mesic vegetation groups (refer to Chapter III), allowing successional advancement and complex habitat structure such as high crown closure, multilayering, and many snags and down logs. These conditions provide habitat for a wide array of wildlife species, including 73 species on the Wenatchee National Forest.

Currently, about 8,136 acres (77%) of this vegetation group that is in a late-successional condition. In the absence of any major disturbance, it is expected that in 50 years 8,230 acres (78%), and in 100 years 9,794 acres (92%) of this habitat would be in a late-successional condition.

Wildlife species associated with the late-successional conditions of this vegetation group and are of special status include the northern goshawk, bald eagle, northern spotted owl, great gray owl, flammulated owl, pileated woodpecker, downy woodpecker, hairy woodpecker, white-headed woodpecker, black-backed woodpecker, three-toed woodpecker, red-breasted sapsucker, Williamson's sapsucker, northern flicker, ruffed grouse, little willow flycatcher, olive-sided flycatcher, chestnut backed chickadee, black-capped chickadee, red-breasted nuthatch, pygmy nuthatch, tailed frog, spotted frog, Cascade frog, larch mountain salamander, Van Dyke's salamander, warty jumping slug, blue-gray tail-dropper, papillose tail-dropper, Columbia pebblesnail, long-legged myotis, long-eared myotis, fringed myotis, Yuma myotis, silver-haired bat, western big-eared bat, pallid bat, elk, lynx, marten, and fisher.

The Moist Grand Fir/Mesic Western Hemlock vegetation group is capable of providing structures that compose suitable spotted owl nesting, roosting, and foraging habitat while remaining within the range of historic variability. Four (40%) of the spotted owl activity centers located within this LSR are located within this vegetation group or in the Wet Forest Group.

(4) Wet Forest Group

The Wet Forest Group covers about 1,781 acres (5%) of Haystack and Upper Nile. Historically fire occurred relatively infrequently (refer to Chapter III) allowing for succession to result in complex forest structures such as high crown closure, multilayering, and high numbers of snags and down logs. These conditions provide habitat for about 54 species that are associated with the late-successional conditions of these forests.

Currently, 1,717 (96%) acres are in a late-successional condition.

Wildlife species that are associated with the late-successional conditions of this vegetation group and are of special status include northern goshawk, bald eagle, northern spotted owl, great gray owl, flammulated owl, pileated woodpecker, downy woodpecker, hairy woodpecker, white-headed woodpecker, black-backed woodpecker, three-toed woodpecker, red-breasted sapsucker, Williamson's sapsucker, northern flicker, ruffed grouse, little willow flycatcher, olive-sided flycatcher, red-breasted nuthatch, pygmy nuthatch, tailed frog, spotted frog, Cascades frog, larch mountain salamander, Van Dyke's salamander, Warty jumping slug, blue-gray tail-dropper, papillose tail-dropper, Columbia pebblesnail, long-legged myotis, long-eared myotis, fringed myotis, Yuma myotis, silver-haired bat, western big-eared bat, pallid bat, elk, lynx, marten, and fisher.

The Wet Forest Group is capable of providing structure that composes suitable spotted owl nesting, roosting and foraging habitat while remaining within the historic range of variability. There are four spotted owl activity centers located within the Wet Forest and Moist Grand Fir/Mesic Western Hemlock groups. This is 40% of the total known activity centers within these LSR/MLSA's.

(5) Subalpine Fir

Subalpine Fir covers about 1,997 acres (6%) of these areas. Historically, fire frequency was relatively low but when fires did occur they were of high intensity. The longer fire return interval allowed for successional advancement that resulted in complex habitat structure such as high canopy closure, high numbers of snags and down logs. Landscape pattern was historically highly variable with a mosaic of seral stages providing habitat for a variety of wildlife species. About 41 wildlife species within the LSR are associated with the late-successional conditions of these forests.

Currently, about 1,477 acres (74%) of the Subalpine Fir forests are in a late-successional condition. In the absence of any large scale disturbances it is expected that in 50 years 1,504 acres (75%), and in 100 years 1,734 acres (87%) would be in a late-successional condition.

Wildlife species that are associated with the late-successional forests in this vegetation group and have special status include the tailed frog, Cascade frog, larch mountain salamander, Van Dyke's salamander, northern goshawk, bald eagle, northern spotted owl, great gray owl, pileated woodpecker, downy woodpecker, hairy woodpecker, black-backed woodpecker, three-toed woodpecker, Williamson's sapsucker, little willow flycatcher, olive-sided flycatcher, pygmy nuthatch, long-eared myotis, Yuma myotis, lynx, and marten.

Spotted owls occasionally use these forests, however, usually they only provide foraging habitat. No spotted owl activity centers were located in the subalpine fir forest group.

c) Species Specific Information

The information presented in this section provides an overview of what is known about the species identified in Appendix 27 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas" as species of special status. Information is provided on a species by species basis whenever it is available.

(1) Endangered Or Threatened Wildlife Species

There are five wildlife species that are federally listed as Threatened or Endangered and could occur within the Haystack MLSA or Upper Nile LSR. These include the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), northern spotted *owl (Strix occidentalis caurina*), grizzly bear (*Ursus arctos*), and gray wolf (*Canis lupus*).

(a) Bald Eagle and Peregrine Falcon

The bald eagle is known to occur within the Haystack MLSA and is absent from the Upper Nile LSR. No surveys for bald eagles have been completed in either of these areas. Peregrine falcons are known to occur within the Haystack MLSA and are suspected to occur within the Upper Nile LSR. No surveys for peregrine falcons have been completed in the Upper Nile LSR and about 25% of the habitat within the Haystack MLSA has been surveyed. An active peregrine nest site is located in the Haystack MLSA.

(b) Northern Spotted Owl

A total of 8 spotted owl activity centers occur within the Haystack MLSA and two activity centers occur within the Upper Nile LSR. There is 9,998 acres (41%) of spotted owl habitat for nesting/roosting and foraging within the Haystack MLSA and 6,136 acres (67%) of spotted owl habitat within the Upper Nile LSR. There is potential for 17,665 acres (76%) in Haystack and 7,354 acres (80%) in Upper Nile, for suitable habitat. All of the spotted owl habitat has been inventoried. The estimated amount of habitat within a 1.8 mile radius of the 10 activity centers is shown in Appendix 12 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas". Six (60%) of these activity centers are currently below threshold habitat levels, three (30%) are at threshold, and one is above threshold levels. The tables below display information about the spotted owl associated with the Upper Nile LSR and Haystack MLSA. Four of the spotted owl sites below threshold need to be monitored for habitat verification.

Table II-2, Spotted Owl Information for Upper Nile LSR & Haystack MLSA

Spotted Owl	Status[3]	Ownership[4]	Dry or Wet Owl[5]	Threshold[6]	Critical Habitat Unit (CHU)	Forest Interior?[8]	Suitable Spotted Owl Habitat	Total Dispersal Habitat
SO814	P	FS	Wet	At Threshold			**3,137**	**709**
SO862	RS	FS	Wet	Optimum			**4,270**	**344**
SO863	P	FS	Wet	At Threshold		Inside	**3,944**	**616**
Haystack MLSA								
SO806	P	FS	Dry	Below Threshold		Near	**3,046**	**475**
SO814	P	FS	Wet	At Threshold			**3,137**	**709**
SO846	P	FS	Dry	Below Threshold			**2,898**	**776**
SO866	P	FS	Wet	At Threshold		Near	**3,138**	**699**
SO868	P	FS	Dry	Below Threshold		Near	**1,694**	**1,531**
SO879	RS	FS	Dry	Below Threshold		Near	**2,707**	**1,077**
SO883	P	FS	Dry	Below Threshold		Inside	**2,857**	**825**
SO890	P	FS	Dry	Below Threshold		Near	**2,483**	**890**

[1] Near the LSR or MLSA but not inside the LSR or MLSA.

[2] Spotted owl site overlaps with other Upper Nile LSR/ Haystack MLSA.

[3] RS = Residential Single; P = Pair; PY = Pair with Young, based on highest occupancy.

[4] FS = Forest Service; PVT = Private Ownership (ownership at activity center).

[5] If the majority of suitable spotted owl habitat in .7 mile circle is dry or mesic, then it is a dry spotted owl. If the majority is wet, then it is a wet spotted owl..

[6] **Below Threshold**: < 2,663 total suitable spotted owl habitat acres in 1.8 mile circle or < 500 total suitable spotted owl habitat acres in 0.7 mile circle.

At Threshold: 2,663-3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

Optimum/Target: > 3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

[7] The activity center is within 1/2 mile of the CHU.

[8] **Inside** = activity center is at least 600' inside (forest interior) late successional habitat.

Near = activity center is inside late successional habitat near forest interior.

[9] Habitat within 1.8 mile circle around activity center. Dry dispersal habitat includes vegetation codes 11, 13, and 52; mesic includes code 21; and wet includes codes 31, 35, 61, and 41.

[10] Dry suitable spotted owl habitat includes vegetation code 12 where size/structure is multistory greater than 9" DBH; mesic includes code 22; and wet includes codes 32, 36, 62, 64, and 42.

[11] A larger circle will be needed if there is less than 100 acres of suitable habitat

(c) Critical Habitat Unit for Northern Spotted Owl

In all LSR/MLSAs, except the Swauk LSR, Shady Pass LSR, Deadhorse LSR, Boundary Butte LSR, Tumwater MLSA and Sand MLSA, these reserves are predicted to provide the needs for spotted owl recovery over time (50+ years). They will also provide the function the CHUs were designated for. Coupled with the LSR/MLSA management, riparian reserve function, Wilderness areas, and Unmapped LSRs, the needs of the spotted owl will be met. These reserves function for connectivity and spotted owl home ranges. It is concluded that the LSR/MLSAs meet the function of the CHU system, as intended in the NWFP (NWFP C-9). Monitoring and maintaining connections, as well as meeting LSR goals will be ongoing.

(d) Grizzly Bear and Gray Wolf

No class 1 grizzly bear observations have been made within the Upper Nile LSR and Haystack MLSA. Grizzly bears and gray wolves are suspected to occur within the LSR and none of their available habitat has been surveyed.

(e) Marbled Murrelet

The Upper Nile LSR and Haystack MLSA are outside of the 55 mile marine foraging zone for marbled murrelets. It is not expected that marbled murrelets would be located this far from marine foraging.

(2) Birds

The goshawk is known to occur in both of these areas. No surveys have been completed. The little willow flycatcher and olive-sided flycatcher are known to occur in the Upper Nile LSR and suspected to occur in the Haystack MLSA. No surveys have been completed for these species in the Upper Nile LSR and <5% of their habitat has been surveyed in the Haystack MLSA.

(3) Amphibians

No surveys for the tailed frog have been completed in either of these areas, however, they are known to occur in both areas. It is unknown if the spotted frog occurs in these areas. About 10% of the habitat in the Haystack MLSA have been surveyed and none of the Upper Nile has been surveyed. Cascades frogs are known to occur in both areas. Surveys have been completed in 10% of the Haystack MLSA and none of the Upper Nile LSR.

(4) Mollusks

No surveys for the Columbia pebblesnail have been conducted and it is unknown if they are present.

(5) Mammals

The long-legged myotis and long-eared myotis are suspected to occur in both of these areas. Surveys have been completed over <5% of their habitat in the Haystack MLSA and none within the Upper Nile LSR. The fringed myotis and Yuma myotis are both unknown in these areas. Surveys have been completed over <5% of their habitat within the Haystack MLSA and none within the Upper Nile LSR. The western big-eared bat is suspected to occur within the Haystack MLSA where <5% of their habitat has been surveyed. In the Upper Nile LSR it is unknown if the western big-eared bat occurs and no surveys have been completed.

No surveys for the lynx, wolverine or fisher have been completed in either of these areas. The lynx is suspected to occur in the Upper Nile LSR and it is unknown if it occurs in the Haystack MLSA. The fisher and wolverine are suspected to occur in both areas.

(6) Management Indicator Species

There are 12 wildlife species that are listed as management indicator species that occur or could occur within the Upper Nile LSR and Haystack MLSA. These species include the pileated woodpecker (*Dryocopus pileatus*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), three-toed woodpecker (*Picoides tridactylus*), red-breasted sapsucker (*Sphyrapicua ruber*), Williamson's sapsucker (*Sphyrapicua thyroideus*), northern flicker (*Colaptes auratus*), ruffed grouse (*Bonasa umbellus*), mule deer (*Odocoileus hemnionus*), elk (*Cervus elephus*), beaver (*Castor canadensis*), and marten (*Martes americana*).

(7) Primary Cavity Excavators

Surveys for primary cavity excavators have been completed over <5% of their habitat within the Haystack MLSA and none have been completed within the Upper Nile LSR. The pileated woodpecker, three-toed woodpecker, and northern flicker are known to occur on both of these areas. The downy woodpecker is suspected to occur in the Haystack MLSA and it is unknown if they occur in the Upper Nile LSR. The hairy woodpecker is known to occur in the Haystack MLSA and is suspected in the Upper Nile LSR. The red-breasted sapsucker is suspected to occur in both areas. The Williamson's sapsucker is known to occur in the Haystack MLSA and suspected to occur in the

(8) Ruffed Grouse and Beaver

Surveys for the ruffed grouse have been completed on <5% of their available habitat within the Haystack MLSA and they are known to occur. Surveys for ruffed grouse have not been completed in the Upper Nile LSR and it is unknown if they are present. Beaver are suspected to occur in the Haystack MLSA and it is unknown if they occur in the Upper Nile LSR. No surveys for beaver have been completed in either area.

(9) Mule Deer, Elk

Mule deer and elk are known to occur within both areas. No surveys for either species have been completed. A winter feeding station for elk is located in the Haystack MLSA.

(10) Marten

Marten are suspected to occur in both areas and no surveys have been completed.

(11) Survey And Manage, Protection And Buffer Species

There are eight species that do or could occur within the Haystack MLSA or Upper Nile LSR and are identified as survey and manage, or protection and buffer species. These include the great gray owl (Strix nebulosa), flammulated owl (Otis flammeolus), White-headed woodpecker (Picoides albolarvatus), black-backed woodpecker (Picoides arcticus), pygmy nuthatch (Sitta pygmaea), warty jumping slug (Hemphillia glandulosa), blue-gray tail-dropper (Prophysaon coeruleum), and papillose tail-dropper (Prophysaon dubium).

(12) Birds

It is unknown if the great gray owl occurs within the Haystack MLSA and they are suspected to occur in the Upper Nile LSR. No surveys have been completed in either area for great gray owls. No surveys have been completed for the flammulated owl, however, they are known to occur in both areas. No surveys for the white-headed woodpecker, black-backed woodpecker, or pygmy nuthatch have been completed in the Upper Nile LSR and <5% of their habitat has been surveyed in the Haystack MLSA. The white-headed woodpecker is known to occur in the Haystack MLSA and is absent from the Upper Nile LSR. The black-backed woodpecker is known to occur in both areas. The pygmy nuthatch is suspected to occur in both areas.

(13) Mollusks

It is unknown if the warty jumping slug, blue-gray tail-dropper, or papillose tail-dropper occur in the LSR/MLSA and no surveys have been completed.

(14) Amphibians

No surveys of the larch mountain salamander or the Van Dyke's salamander have been conducted within the LSR/MLSA and it is unknown if they occur here.

3. Habitat Effectiveness

Habitat effectiveness was assessed using the current open road density and the amount of security habitat. The current open road density is 3.65 mi./sq.mi. in the Upper Nile LSR and is 5.04 mi./sq.mi. in the Haystack MLSA. The amount of security habitat is 2% in the Upper Nile LSR and 6% in the Haystack MLSA. Based upon these variables, the current level of habitat effectiveness for late-successional species in these areas is considered to be "low". This situation could be greatly improved through road obliterations identified during access and travel management planning.

4. Aquatic

The lands within the Haystack MLSA and Upper Nile LSR contain portions of 5 fish production units (subwatershed's). These subwatershed's are Mainstem Naches, Devil-Swamp, Nile-Dry, Lower Rattlesnake, North Fork Rattlesnake. Of the 9,191 acres in Upper Nile LSR, 1,108 acres (12%) are estimated to be contained within Riparian Reserves. In Haystack MLSA an estimated 6,832 acres (13%) of 76,502 acres are estimated to be within the Riparian Reserve. The average annual precipitation in Haystack MLSA ranges between 30 and 40 inches. In Upper Nile LSR the average annual precipitation is between 35 and 45 inches. The "Land Type Associations" within the LSR and MLSA are described as having high deep seated failure hazard and/or high moisture stress.

The Naches - Little Naches and the Rattlesnake are key watersheds. The streams that drain from Haystack MLSA and Upper Nile LSR include Devil, Swamp, Lost, Nile, Orr, Glass, Rattlesnake creeks and the Naches River. .

5. Human Uses

a) Overview

The Upper Nile LSR and Haystack MLSA are located on the Naches Ranger District. The primary access is via Highway 410 which is open year round. This Highway passes through the Haystack MLSA. Highway 410 is designated as the Mather Memorial Parkway which extends one half mile on either side of the highway. This designation reflects the importance of the travelway for recreational activities.

b) Prehistoric and Historic Summary

There is a very high density (the highest density on the Wenatchee National Forest) of American Indian sites within this LSR and MLSA. These sites are particularly prevalent along the main rivers and open ridgetops.

c) Recreation Use

(1) Camping

There are no campgrounds within either area, although Cottonwood Campground with sixteen units is located just outside of the Haystack MLSA. Some popular areas have had toilets installed to lessen sanitation problems. This includes sites at Clover Springs, Lindsay Camp, McDaniel Lake, and Rattlesnake Springs. Dispersed camping occurs throughout the this area adjacent to roads and water, it is especially heavy during hunting season.

(2) Trails

There are about two miles of a single tread, motorized trail within Haystack MLSA (Trail #964/964A) There are approximately another 14 miles of system roads that are popular with four wheel drive recreationists. This includes road #'s 696, 665, and 697. Dry Ridge is another popular four wheel drive area that is not on the road system inventory. In addition to these routes there are a number of high clearance roads in the southern portion of the MLSA used by recreationists.

(3) Recreation Special Uses

There are a number of recreation residences (privately owned cabins on National Forest land authorized by special use permit) along the Naches River. One organization camp, the Lost Creek Christian Camp, (also authorized by special use permit) is located within the Haystack MLSA.

(4) Other Recreation Activities

Other recreational use occurring in this area includes driving for pleasure, wood cutting, fishing, and picnicking. Edgar Rock and Little Bald Lookout site (lookout has been removed) are popular vista points. Snowmobiling is a popular activity throughout the area in the winter months.

d) Minerals

There is very little mining activity in this area.

e) Landownership

The town of Cliffdell and other private land follows the Naches River, the remainder of Haystack MLSA is in federal ownership.

f) Roads

Most of the Upper Nile LSR and Haystack MLSA are accessible by car or jeep.

g) Social and Economic Considerations

Outside of the privately owned land and year round residences along the Naches River, recreation is the primary use of the area. Businesses in Cliffdell cater to the recreationists using the area.

B. Analysis Between the LSR/MLSA's

1. Sustainability

The sustainability of LSR's/MLSA's across the forest is displayed in Table 19. Both the Nile LSR and Haystack MLSA fall in the upper 1/3 of all LSR's/MLSA's in terms of the amount of at risk vegetation which puts them in the lower 1/3 in terms of overall sustainability. Haystack has a higher amount of at risk vegetation than any other LSR/MLSA on the forest. An important consideration in terms of sustainability is the relationship of Haystack/Upper Nile compared to their neighboring LSR's/MLSA's. Three LSR's (Manastash, Bumping and Rattlesnake) and one MLSA (Milk Creek) are for the purposes of this analysis considered to be neighbors. The following table shows the acres

at risk and the ignition risk determined in the forest-wide sustainability analysis for the Haystack/Upper Nile and its four neighboring LSR's/MLSA's.

Table II-3, Sustainability for Haystack/Upper Nile MLSA (Acreage and Percent at Risk)

	LSR/MLSA at Risk		LS Forest at Risk		
LSR/MLSA	**Acres**	**Pct.**	**Acres**	**Pct.**	**Ignition Risk**
Haystack	20,079	81%	16,154	100%	Moderate
Upper Nile	4,979	54%	4,589	73%	Moderate
Manastash	38,858	37%	33,684	49%	Moderate
Bumping	165	1%	165	2%	Moderate
Milk Creek	11,432	73%	8,513	100%	Moderate
Rattlesnake	6,641	63%	4,846	82%	Moderate

The factor driving this analysis, looking at sustainability issues between LSR's/MLSA's, is the amount and location of at risk vegetation between the Haystack and Upper Nile and its four neighbors. In other words, linkages in at risk vegetation that would facilitate the spread of fire from one LSR/MLSA to the other. Review of maps of at risk vegetation reveals that there are significant amounts of at risk vegetation between Haystack/Upper Nile and all four of the neighboring LSR/MLSA's.

This creates a situation where fire burning within or between any of these LSR/MLSA's presents a risk to the others. The Bumping LSR is however comprised mostly of moist and wet vegetation groups and it is not likely that any large portion of this LSR would be affected by this situation. All of the others do have significant amounts of at risk vegetation within as well as between them. The potential for fire occurring with resultant effects on several of these LSR's/MLSA's at one time is very high, similar to what happened on the north end of the forest in 1994.

a) Implications

1. Reduce stand density in dense dry successionally advanced vegetation types (types 12 and 22) where they exist between the Haystack/Upper Nile and all four neighboring LSR/MLSA's. Of highest priority are those areas between Haystack/Nile and Milk Creek MLSA and between Haystack/Nile and Rattlesnake LSR.

   Potential Projects - Commercial Thinning

2. Reduce fuel loadings along roads that exist between these LSR's/MLSA's to increase the roads effectiveness as fuel-breaks.

   Potential Projects - Piling of down fuels, firewood gathering, pruning to reduce vertical fuel concentrations (all vegetation types), construction of shaded fuel-breaks.

3. Reduce fuel loadings in young stands.

   Potential Projects - Precommercial thinning.

2. Northern Spotted Owl

The Upper Nile LSR and the Haystack MLSA are not one of the "big 3" large population cluster/source center LSR's, for the recovery of the spotted owl. They are part of the smaller "local population" centers, which are linked to the metapopulations through dispersing individuals. The spotted owl is a Threatened species, with the recovery dependent on the implementation of the NWFP, especially in LSR/MLSA's (FSEIS Appendix G, Biological Opinion, 1994).

3. Connectivity (Plant, Wildlife and Northern Spotted Owl)

a) Plant Connectivity

Connectivity can be addressed at several spatial scales when assessing an individual LSR. Connectivity of the LSR/MLSA network on the Wenatchee National Forest has been addressed above in the section titled "Function of the LSR/MLSA Network." Connectivity specific to the Haystack MLSA and Upper Nile LSR for vascular plants is analyzed here. The Haystack MLSA and Upper Nile LSR are referred to below as a single connected area. Refer to Forest-wide Assessment discussions for connectivity description for lichens, bryophytes and fungi.

First, connectivity relative to the Haystack MLSA and Upper Nile LSR can be viewed from how well habitat is connected to surrounding LSR's or MLSA's. Species and the habitats they're associated with are presented in Appendix 6 of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas". Firstly, connectivity between Haystack MLSA/Upper Nile LSR and the Bumping LSR only exists within the dry and moist grand fir vegetation groups for species with high dispersal capabilities. Species with moderate and low dispersal capabilities are dependent on vegetation which occurs between these two areas. No connectivity exists for any dispersal class for the subalpine fir series, the wet forest, or the whitebark pine/subalpine larch vegetation groups. This is a consequence of the absence of these vegetation groups in one or the other MLSA/LSR.

Connectivity between the Haystack MLSA/Upper Nile LSR and the Milk MLSA occurs for all dispersal classes in the dry and moist grand fir vegetation groups. No connectivity exists for any dispersal class for any other vegetation group, as all other vegetation groups are limited or absent.

Relative to the Manastash LSR, in the dry and moist vegetation groups all dispersal classes are dependent on vegetation between areas. In general, dispersal is dependent on the vegetative network provided by the Milk MLSA. No connectivity exists within the subalpine fir series. This is a consequence of the inherent landscape pattern, or the juxtaposition of this vegetation series on the landscape. Additionally, no connectivity exists for the wet or whitebark pine/subalpine larch vegetation groups as these groups are limited or not present in one or more of the MLSA's/LSR's.

Regarding the Rattlesnake LSR, connectivity within the dry and moist grand fir vegetation groups exists for species with moderate and high dispersal capabilities. Species with low dispersal capabilities are dependent on vegetation outside of this network. In the subalpine fir series, species with moderate and high dispersal capabilities are dependent on vegetation outside of the network, primarily vegetation which occurs within the wilderness. No connectivity exists for species with low mobility. Again, this is the result of inherent landscape pattern and juxtaposition of vegetation patches on the landscape. Due to the absence of the wet and whitebark pine/subalpine larch vegetation groups, a discussion of connectivity is unwarranted.

Table 4, Upper Nile/Haystack -- Vascular Plant Connectivity

	Vegetation Group				
LSR/MLSA	**Dry/Mesic**	**Moist GF**	**Subalpine**	**Wet**	**Whitebark**

Dispersal Class	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Bumping	D	D	Y	D	D	Y	A	A	A				A	A	A
Milk	Y	Y	Y	Y	Y	Y	A	A	A				A	A	A
Manastash	D	D	D	D	D	D	N	N	N				A	A	A
Rattlesnake	D	Y	Y	D	Y	Y	N	D	D				A	A	A

Dispersal Codes = Y=Yes (Connectivity); N=No (Not Connected); A=Veg Group Absent; D=Dependent (Connectivity Depends on Outside Habitat)

In general, few opportunities to improve habitat connectivity for vascular plant species associated with a particular forest vegetation group were identified as a result of this analysis. In the dry/mesic vegetation group, the lack of connectiveness is primarily a result of inherent landscape patterns. In the moist grand fir vegetation group, maintenance of existing dispersal corridors and promotion of mature/late-successional vegetation may provide opportunities for improving connectivity.

b) Wildlife Connectivity

The following are the results of applying the forest wide connectivity module to the Haystack MLSA and Upper Nile LSR (refer to the Dispersion Index in Appendix 1). A total of three linkages for Haystack and two for Upper Nile were evaluated.

Table II-5, Dispersal Indices for Haystack MLSA Forest Wide Connectivity Module.

Linkage	Distance (MI)	Low	Moderate	High	Index
HS-Milk Creek	0.6	No	Yes	Yes	2
HS-Upper Nile	0	Yes	Yes	Yes	3
HS-Rattlesnake	1.9	No	No	Yes	1
Overall Rating					2.0
Upper Nile					
UN-Bumping	1.9	No	Yes	Yes	2
UN-Haystack	0	Yes	Yes	Yes	3
Overall Rating					2.5

(1) Restoration Opportunities

No restoration projects were identified to address connectivity outside of these areas. A more site specific analysis may provide information to develop such strategies.

c) Northern Spotted Owl Connectivity

Objectives in the Upper Nile LSR should protect and enhance conditions of late successional and old growth forest ecosystems, while serving as habitat for late successional forest related species,

including the northern spotted owl (NWFP A-4, 1994). The objectives in the Haystack MLSA are similar, however, MLSA's were identified for certain owl locations in drier provinces, where regular and frequent fires are a natural part of the ecosystem (NWFP A-4, C-23).

The Upper Nile and Haystack are important for maintaining well distributed and well-connected spotted owl populations. The five nearest LSR/MLSA's were evaluated to determine their potential for dispersal to occur. This analysis showed that spotted owls could likely disperse to the Bumping LSR, Rattlesnake LSR, Milk MLSA, and the Upper Nile and Haystack respectively.

Habitat providing dispersal/connectivity corridors between LSR's (outside LSR/MLSA's) include: William O. Douglas Wilderness for Upper Nile and somewhat for Haystack; upper Devil's Creek; Edgar Rock to Boulder Caves; Flat Iron Mountain to Soda Spring; upper Rattlesnake; Dévils' Canyon; North Fork Nile; and Lefthand Creek (see Forest Interior map). These connectivity corridors should be monitored for effectiveness, and should overlap into Riparian Reserves, unmapped LSR's, wilderness, etc.

C. Analysis Within LSR/MLSA

1. Unique Habitat and Species

The following is the discussion and results of the Unique Habitat and Species module for the Upper Nile LSR and the Haystack MLSA. See Appendix 1 for order, explanations and process of modules.

a) Forest-wide Overview of Unique Habitats and Species

Over all, these two sites are not as high as others on the Forest for unique habitats and species. The Meeks Table RNA is adjacent to the Haystack MLSA. Meeks Table is an RNA for ponderosa pine, pine grass plant community without co-dominance of Douglas-fir. The William O. Douglas Wilderness is to the west of the Upper Nile LSR and to the southwest of the Haystack MLSA.

The Haystack MLSA has one of the highest amounts of rock/talus, natural openings, and deciduous trees compared to all the other LSR/MLSA's (see Table 27 "Unique Habitats and Species" for all LSR/MLSA's in the main body of the assessment). It has a high number of known special wildlife species, 41 species and a fair amount of known special plant species, 26 species (see same table 27 noted above, and Appendix 6 Plant Species Lists and Appendix 27 Wildlife Species List of the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas"). There are more roads and trails in riparian reserves (5.16 mi./sq. mi.) than the whole MLSA (3.78 mi./sq. mi.). There is fairly low amounts of forest interior (9%) and late-successional habitat (21%), with much in forest dry.

For LSR's, the Upper Nile has less unique habitats and species evident. It is higher in talus, and dry meadows and has 25 special wildlife species and 30 special plant species known on the LSR. The Upper Nile, has the reverse trend in riparian areas from all the other LSR/MLSA's, it has fewer roads and trails within riparian reserves (2.19 miles per square mile) than in the whole LSR (3.65 mi./sq. mi.). There is very low amounts of forest interior (9%) and very high amounts of late successional habitat (66%).

The Haystack MLSA is in a transition zone between wet and dry vegetation, and has some disjunct forest populations. Overall, the Upper Nile LSR has moderate to high quality of snags, and the Haystack MLSA has low quality of snags.

American Indian food gathering and other material collections would be moderate to high for the Forest. Cedar trees for baskets in the bottom lands, salmon along the Naches River, elk and deer are found in this LSR and MLSA.

b) Unique Habitats and Species Within

Each LSR/MLSA can be evaluated for biodiversity, connectivity and function (see Function of Unique Habitats in the main body of the Forest-wide Assessment). As part of the analysis past management activities effect the function of unique habitats and species. For the Upper Nile LSR these include: total open road density of 3.65 miles per square mile: security habitat of 2%; roads and trails in riparian reserves of 2.19 miles per square mile; and past harvest activities of 45% in the LSR.

The Haystack MLSA has total open road density of 3.78 miles per square mile: security habitat of 6%; roads and trails in riparian reserves of 5.16 miles per square mile; and past harvest activities of 95% in the MLSA.

(1) Abundance and Ecological Diversity

Compared to all the other LSR/MLSA's, the Upper Nile LSR and the Haystack MLSA is moderate in providing high amounts of acreage and wide variety of plant communities and environments. This includes acreage for unique plant and animal habitats, juxtaposition of habitats, availability of wilderness or areas of rarity, and known observations from the plant and animal species list.

(2) Connectivity for Unique Habitats and Species

The Upper Nile LSR is moderate and the Haystack MLSA is low in quality of providing high connectivity in a landscape pattern for biological flow to sustain unique animal and plant communities. This includes the amount, percent and number of patches of late successional habitat, forest interior habitat patches, and the juxtaposition of wilderness and areas of rarity.

(3) Process and Function of Unique Habitats and Species

The Upper Nile LSR and the Haystack MLSA are moderate in providing quality functioning for unique species and habitat. This includes development and maintenance of unique ecosystems, including ecological values for unique species and populations. The plant and animal species list for known observations makes up a large part of this analysis, as well as proximity to wilderness and areas of rarity, which sustain habitat function.

Identified areas of high abundance, connectivity and function for unique habitats and species in the Chiwawa LSR are:

1. Rattlesnake to Meeks Table: Rock/Talus, wetlands, meadows, shrubs, riparian reserves, PETS, RNA and wilderness..
2. Little Bald Mt. to Clover Springs to Schneider Springs: Wetlands, talus/rock, Forest interior, snags, wilderness.
3. Naches River (Cliffdale to Cottonwood, Edgar Rock, Haystack): talus/rock, wetlands, riparian reserves, forest interior, natural openings, PETS
4. Upper Nile: riparian reserves, natural openings, rock/talus, forest interior, PETS spp..
5. Lower Nile: wetlands, deciduous, meadows, natural openings.
6. Glass Creek: Talus, rock, riparian reserves, forest interior.

c) Restoration Opportunities And Potential Projects for Unique Habitats and Species:

1. Reduce road and trail densities in riparian reserves.
2. Reduce open road densities throughout the LSR.
3. Increase amount of security habitat.
4. Increase and accelerate late successional habitat and forest interior habitat. Thin to accelerate old growth.
5. Reduce roads and trails in unique habitats (meadows, talus, wetlands, etc.).
6. Reduce noxious weed spread in meadows and natural openings.
7. Reduce roads in forest interior patches
8. Protect large trees and screen near talus, cliffs, caves, meadows.
9. Reduce encroaching trees in subalpine meadows.
10. Prescribed fire in ponderosa pine.
11. Reduce Fragmentation of Wet Forest.
12. Protect riparian from grazing.
13. Provide American Indian site access.
14. Maintain black-backed woodpecker nesting/roosting/foraging habitat.
15. Meet high end snag levels.
16. Create log den sites in low quality roaded/forest for marten, fisher, lynx.
17. Protect/maintain/enhance/monitor PETS.
18. Prescribed fire in natural openings as part of fire climax.
19. Interpret values and protection/maintenance of unique habitats and species.
20. Acquire non-Forest System lands with high degree of unique species or habitat.

d) Snag/Log/Green Tree Recruitment

The following is the discussion and results of the Snag/Log/Green Tree Recruitment sub-set module of the Unique Habitats module. See Appendix 1 for order, explanations and process of modules. Snag quality can be judged by a continual supply of tree structure in various stages of decay, size and species. This can be best provided in the moist and wet vegetation groups, areas with large amounts of late-successional habitat, areas with little fragmentation, areas with high amounts of forest interior, and areas with high functioning riparian reserves.

A landscape level approach was used to analyze snag, green tree recruitment, and downed wood habitat. The landscape approach reviews the quality of snag, down logs, and green tree recruitment for the LSR's. GIS and specific knowledge was used: including: forest vegetation types and acreages, amount of forest burned, percentage of past timber harvest (clearcuts and partial cuts), road densities, security habitat, Riparian Reserve acreages, pathogens, the number of spotted owl home ranges, forest interior amounts, and the percentage of late successional habitat. The qualitative analysis for the LSR/MLSA included green tree availability, short term and long term snag/log availability, burn intensity, site specific wildlife needs, land allocation goals, and the quality of refugia/security habitats.

(1) Quality Rating

Each attribute for snag/downed log/green tree recruitment has a rating (see chart), a final rating incorporates all values towards one rating for the LSR/MLSA. Actual snag, downed log and green tree recruitment numbers, sizes, stages of decay and species is not practical to analysis on a landscape basis. This can also be done on a 40 acre grid, or sub-watershed basis. When data is available, incorporate actual availability data into the analysis. Snag and Downed Log levels are based on Wenatchee National Forest Snag Levels, Fire Recover y Snag Levels, Everett et al Spotted owl and Snag studies, and wildlife needs. Qualitative ratings are based on habitat needs for snag, downed log, and recruitment tree wildlife and plant species needs. Species using these habitats include:

pileated woodpecker	spotted owl	hoary bat	marten & fisher	tailed frog
black-backed woodpecker	flammulated owl	silver-haired bat	flying squirrel	NW & PG salamander
white-headed woodpecker	great gray owl	big brown bat	lynx	lichens & fungi
olive-sided flycatcher V	Vaux's swift	voles, shrewmole	bald eagle	land snails

**** UPPER NILE SNAG ANALYSIS****

HIGH QUALITY	MEDIUM QUALITY	LOW QUALITY
Moist & Wet Veg Groups 61%	Subalpine Fir & Mesic Veg 22%	Dry & Whitebark 7%
>60% LS (non-dry) Habitat	15% - 60% LS Habitat 65%	<15% LS Habitat
80% - 100% LS (all) Habitat	40% - 80% LS/M Habitat 69%	<40% LS/M Habitat
> 30% Forest Interior (non-dry)	15% -29% Forest Interior Non-dry	<15% Forest Int ND 9%
>10% Forest Interior Dry	5% - 9% Forest Interior Dry	< 5% Forest Int Dry .0%
>16% in Riparian Reserves	10% to 16% in Riparian Reserves 12%	<10% in Rip Res
0 Mi/Sq Mi Any Rds in Rip Res	0 to 1 Mi/Sq Mi Rds in Rip Res	> 1 Mi/Sq Mi Rd RR 2.19 mi/sq/mi
< 1 Mi/Sq Mi Open Roads	1 Mi to 2.5 Mi/Sq Mi Roads	> 2.5 Mi/Sq Mi Rds 3.65 mi/sq/mi
>70% Security Habitat	50% to 70% Security	<50% Security Hab

	Habitat	2%
>10% in Past Burns		<10% in Past Burns <10%
>50% Insect/Pathogens	25% - 50% Insect/Pathogens (see Insect/Disease Write Up)	< 25% Insect/Pathog
<10% Past CC Harvest <10% ?	11% - 25% Past CC Harvest	>25% Past CCs
<10% Past PC Harvest	11% - 50% Past PC Harvest 35%	>50% Past PC

**** HAYSTACK SNAG ****

HIGH QUALITY	MEDIUM QUALITY	LOW QUALITY
Moist & Wet Veg Groups 27%	Subalpine Fir & Mesic Veg 0%	Dry & Whitebark 61%
>60% LS (non-dry) Habitat	15% - 60% LS Habitat 21%	<15% LS Habitat
80% - 100% LS (all) Habitat	40% - 80% LS/M Habitat 67%	<40% LS/M Habitat
> 30% Forest Interior (non-dry)	15% -29% Forest Interior Non-dry	<15% Forest Int ND 2%
>10% Forest Interior Dry	5% - 9% Forest Interior Dry 9%	< 5% Forest Int Dry
>16% in Riparian Reserves	10% to 16% in Riparian Reserves 13%	<10% in Rip Res
0 Mi/Sq Mi Any Rds in Rip Res	0 to 1 Mi/Sq Mi Rds in Rip Res	> 1 Mi/Sq Mi Rd RR 5.16 mi/sq/mi
< 1 Mi/Sq Mi Open Roads	1 Mi to 2.5 Mi/Sq Mi Roads	> 2.5 Mi/Sq Mi Rds 3.6578i/sq/mi
>70% Security Habitat	50% to 70% Security Habitat	<50% Security Hab 6%
>10% in Past Burns		<10% in Past Burns

		<10%
>50% Insect/Pathogens	25% - 50% Insect/Pathogens	< 25% Insect/Pathog (see Insect/Disease Write Up)
<10% Past CC Harvest	11% - 25% Past CC Harvest	>25% Past Ccs >25% ?
<10% Past PC Harvest	11% - 50% Past PC Harvest	>50% Past PC 70%

e) Restoration Opportunities And Potential Projects For Snags/Logs

Reduce roads in riparian reserves; Reduce Roads in Forest Interior Patches

Retain Snags at High End of Range; Incorporate Healthy Insect/Disease Levels,

Complete snag analysis on 40 acre grid

f) Plant Species with Special Status

Three species with special status were identified to occur with in the Haystack MLSA/Upper Nile LSR. There are not immediate viability concerns associated with *Orobanche pinorum* or *Cypripedium montanum.* This is based on the relatively frequent occurrence of these species on the Naches Ranger District. Furthermore, *Orobanche pinorum* is well documented from the Wenatchee National Forest and other forests within the Pacific Northwest Region. Consequently, the Species with Special Status Module would recommend monitoring these species and subsequent development of a Conservation Strategy. Regarding the lichen species *Cyphelium inquinans,* very little information is available on the biology and ecology of this species. Documentation of this species from the Naches Ranger District suggests that this species is associated with various vegetation types and various substrates. Therefore, it is cautiously concluded that no immediate viability concerns exist for this species and monitoring and development of a conservation strategy be completed for this species.

2. Connectivity (Plant and Wildlife)

a) Plant Connectivity

Connectivity is addressed by analyzing the connectedness of habitats or species populations within the MLSA/LSR. Within the Haystack MLSA/Upper Nile LSR, most forest groups are fairly well connected.

Disjunct species populations result from inherent breaks or openings in the landscape. At this time, information is not available to complete this type of analysis for survey and manage species within the Haystack MLSA/Upper Nile LSR.

b) Wildlife Connectivity

The results of applying the within LSR/MLSA connectivity module are presented in this section for the Haystack MLSA and Upper Nile LSR.

Table II-6, Haystack MLSA Wildlife Connectivity

Connect Variable	**Dry**	**MGF/MH**	**Rip. Res.**	**Overall**
%LS or Fire Climax	LS=H,FC=L	H	M	M
Open Road Density	L	L	L	L
Security Habitat	L	L	L	L
Forest Int. Roads	L	L	L	L
% Forest Interior	L	L	L	L

(1) Restoration Opportunities

There is an opportunity to improve the connectivity within the Haystack MLSA through access and travel management that would reduce the road density, especially within the Riparian Reserves (current density is 5.04 mi./sq.mi.). Revegetation of closed roads could be considered to address habitat connectivity for low mobility species.

Thinning and prescribed fire could be used to enhance the development of fire climax ponderosa pine forests and improve their connectivity.

Upper Nile LSR

Conn. Var.	**Dry**	**Mesic**	**MGF/MH**	**SAF**	**Wet**	**Rip.Res.**	**Overall**
%LS or FC	LS=L, FC=L	M	M	M	M	M	M
Open Road	L	L	L	L	L	L	L
Sec. Hab.	L	L	L	L	L	L	L
For. Int Rd.	L	L	L	L	L	L	L
%For. Int.	L	L	L	L	L	L	L

(2) Restoration Opportunities

Habitat connectivity within the Upper Nile LSR could be improved by reducing the open road density through access and travel management. For low mobility species, road closures could consider revegetation of the road surface to enhance the ability of these species to disperse across the road bed.

The use of prescribed fire could be used in the Dry Forests identified as low density to enhance the fire-climax habitats. In addition, thinning followed by prescribed fire in the Dry Forest high density would improve connectivity for fire climax associated species.

Within the Dry Forest and Moist Grand Fir/Western Hemlock many created opening could be evaluated for potential to speed their recovery and development of late-successional forests. Thinning of the single-layered stands in the Moist Grand Fir/Western Hemlock could be used to enhance the development of late-successional forest characteristics.

3. Disturbance Risk Analysis

The Upper Nile LSR and The Haystack MLSA form a contiguous land unit and, for the purposes of this discussion, will be treated as a single entity. The boundary between the two is administrative and does not represent a natural boundary separating different disturbance regimes. Although the Upper Nile LSR is primarily within wetter, more sustainable vegetation types, its location upslope of dry forests within the Haystack MLSA puts it at risk to disturbances originating in the MLSA. As a result of management activities and mortality from insect and pathogens, fuel loads within the more productive forests of the Upper Nile LSR are high, increasing the risk of habitat loss from fires originating outside the LSR boundary. A major storm track crosses both the LSR and MLSA, and lightning strikes frequently along the ridge between the Nile Creek and Rattlesnake Creek drainage's.

Sixty-one percent of the Haystack MLSA consists of dry forest, primarily dry grand fir associations; of that, more than 90 percent is at high risk to insect and pathogen outbreaks and catastrophic wildfires. Upslope from this tinderbox, the balance of this MLSA is within moist grand fir or mesic western hemlock plant associations. Seventy-eight percent of these stands are in a mature, layered condition providing ideal habitat for outbreaks of defoliating insects. Another 10 percent or more has been partially harvested, creating conditions that are ideal for the spread of root pathogens.

About 20 percent of the Upper Nile LSR is composed of successionally-advanced wet forest. Only seven percent is within the dry forest group; however, half the vegetation in this LSR is successionally-advanced and not within the wet forest group. Most successionally-advanced vegetation is within moist grand fir associations or subalpine fir series and would be considered sustainable were it not for the threat of fires originating outside the LSR. Increasing fire risk within the Upper Nile LSR is high mortality from insects and pathogens, most notably fir engraver, annosus root disease, and laminated root rot.

Both the LSR and MLSA are heavily roaded, with the exception of the western edge of the Upper Nile LSR. About 35 percent of the Upper Nile LSR has been entered for timber harvest. Most past harvests occurred in the moist grand fir / mesic western hemlock vegetation type. Preferential removal of early-seral species was the predominant type of harvest within the LSR. Over 70% of Haystack MLSA has also been entered for timber cutting. Partial harvests began in the 1920s; many areas have had multiple entries, with ponderosa pine being heavily cut.

The following information on insect activity in the Upper Nile LSR and the Haystack MLSA is from data collected during the aerial surveys conducted by Region 6 Insect and Disease Group. Activity prior to 1980 was not available on the Forest at the time of this analysis. Light infestations or damage on less than 100 acres are not reported.

Upper Nile LSR

- Mountain pine beetle (w. white pine): 1981, 1988-91
- Mountain pine beetle (whitebark pine): 1993
- Mountain pine beetle (ponderosa pine): 1994
- Douglas-fir beetle: 1988, 1994
- Fir engraver: 1988-91, 1993

- Spruce beetle: 1988
- Western spruce budworm: 1985, 1987-92
- Larch budmoth: 1985

Haystack MLSA

- Western pine beetle: 1980, 1986
- Mountain pine beetle (w. white pine): 1982-3, 1987, 1988 (heavy), 1990
- Mountain pine beetle (ponderosa pine): 1989-90, 1992, 1994
- Douglas-fir beetle: 1988, 1994
- Fir engraver: 1980, 1988, 1989 (very heavy), 1990-1, 1993
- Western spruce budworm: 1985, 1987-1992
- Blackheaded budworm: 1985
- Larch budmoth: 1985
- Balsam woolly adelgid: 1988

Western white pine mortality associated with white pine blister rust and subsequent attack by mountain pine beetles is very high in the Haystack MLSA. Grand fir mortality from the fir engraver is high in both the LSR and MLSA. Mortality of western white pine changes species composition within stands and can reduce structural diversity, even though vegetation composition moves towards late successional stages. Fir engravers tend to produce snags and logs in small size classes. Following a pulse of heavy mortality from fir engravers, risk for catastrophic fires increases for several years because of the vertically-connected, highly flammable fine fuels in the twigs and branches of affected trees.

Table II-7, Disturbance Matrix, Haystack

Veg Type	Fire	Dwarf mistletoes DF WH			Root disease AROS PHWE		HEAN	WPBR	WSB	DFB	FE	Total
10	M	M	L	-	M	M	M	-	L	L	L	M
11	M	M	L	-	M	M	M	-	M	L	L	M
12	H	H	L	-	M	M	H	-	H	H	H	H
13	H	H	L	-	H	H	H	-	H	M	H	H
30	M	M	M	L	M	M	M	H	L	L	L	M
31	M	M	M	L	M	M	M	H	L	L	L	M
32	H	H	H	L	L	H	H	H	H	M	H	H
33	H	H	H	L	M	H	H	H	H	M	H	H

Veg Type	Fire	Dwarf mistletoes DF WH	WL		Root disease AROS PHWE	HEAN		WPBR	WSB	DFB	FE	Total
34	M	L	L	L	L	M	M	H	L	L	L	M
36	H	L	L	L	L	M	M	H	L	L	M	H
37	H	L	L	L	L	H	M	H	L	L	M	H
64	M	L	L	L	M	M	M	H	L	L	M	M

Key to Column Headings: PP = Ponderosa Pine, DF = Douglas-fir, WL = Western Larch, PIPO = Ponderosa Pine; PSME = Douglas-fir; LAOC = Western Larch; AROS = Armillaria root disease; HEAN = Annosus root disease; WPBR = White Pine Blister Rust; WSB = Western Spruce Budworm; DFB = Douglas-fir Beetle; MPB = Mountain Pine Beetle; WPB = Western Pine Beetle.

Key to Letters "-" = no risk = 0; "L" = low risk, "M" = moderate risk, "H" = high risk

Veg Type codes: refer to Appendix 3, in the "Forest-wide Assessment for Late Successional Reserves and Managed Late Successional Areas, Wenatchee National Forest"

Eighty-two percent of the Haystack MLSA has a high composite risk to disturbances (essentially, all but the created openings and non-forested areas are at high risk). Insect and pathogen mortality is high throughout the MLSA, increasing the likelihood that fires burning within the reserve boundaries will be of high severity.

Management objectives to reduce risk of habitat loss from catastrophic wildfires and insect or disease outbreaks include reducing stand density, altering species composition, and reducing vertical and horizontal fuel continuity. Thinning and other activities to reduce stand densities are required to protect spotted owl habitat from fire. Root disease is a problem within some portions of the MLSA. Altering species composition to favor resistant species will help ensure long term sustainability. Below-ground continuity of susceptible species can be reduced by allowing group selection harvests of fir and hemlock between 0.5 to 2 acres and regenerating with ponderosa pine and western larch. Fuelbreaks along the eastern edge and along the urban/wildland interface (Hwy. 410 corridor) is required within this MLSA to protect late-successional habitat.

Silvicultural and other options to attain management objectives stated above include thinning (PCT/CT); pruning; fuelwood collection; mechanical fuel treatments; handpiling fuels; prescribed fire; and favoring the seral, fire-resistant species such as ponderosa pine, and western larch.

Table II-8, Disturbance Matrix, Upper Nile

Veg Type	Fire	Dwarf mistletoes DF WH	WL		Root disease AROS PHWE	HEAN		WPBR	WSB	DFB	FE	Total
10	M	M	L	-	M	M	M	-	L	L	L	M
12	H	H	L	-	M	M	M	-	H	H	H	H

Veg Type	Fire	Dwarf mistletoes DF WL WH			Root disease AROS HEAN PHWE			WPBR	WSB	DFB	FE	Total
13	H	H	L	-	H	M	M	-	H	M	H	H
30	M	M	M	L	M	M	M	H	L	L	L	M
31	M	M	M	L	M	M	M	H	L	L	L	M
32	H	H	H	L	L	M	M	H	M	M	M	H
33	H	H	H	L	M	M	M	H	M	M	M	H
34	M	L	L	L	L	M	M	H	L	L	L	M
36	H	L	L	M	L	M	M	H	L	L	M	H
37	H	L	L	M	L	M	M	H	L	L	M	H
40	M	L	L	L	L	L	L	H	L	L	L	M
41	M	L	M	M	L	L	L	H	L	L	L	M
42	M	L	M	M	L	L	L	H	L	L	M	M
43	L	-	L	L	L	L	L	H	L	-	L	L
60	L	L	L	M	L	M	M	H	L	L	L	L
62	M	L	L	M	L	L	L	H	L	L	L	M

Key to Column Headings: PP = Ponderosa Pine, DF = Douglas-fir, WL = Western Larch, PIPO = Ponderosa Pine; PSME = Douglas-fir; LAOC = Western Larch; AROS = Armillaria root disease; HEAN = Annosus root disease; WPBR = White Pine Blister Rust; WSB = Western Spruce Budworm; DFB = Douglas-fir Beetle; MPB = Mountain Pine Beetle; WPB = Western Pine Beetle.

Key to Letters "-" = no risk = 0; "L" = low risk, "M" = moderate risk, "H" = high risk

Thirty-eight percent of the Upper Nile LSR has a high composite risk to disturbances. Most of the risk to this LSR originates from conditions outside reserve boundaries and from high fuel loads within those portions of the LSR that are adjacent to dry forest types. Management objectives to reduce risk of habitat loss to catastrophic wildfires, insects, and pathogens include reducing stand density, altering species compositions, and reducing vertical and horizontal fuel continuity in stands adjacent to dry forest types. The primary management goal is to protect this LSR from fires originating outside the reserve boundaries. Silvicultural and other options to attain objectives within dry forest include thinning (PCT/CT); pruning; fuelwood collection; mechanical fuel treatments; handpiling fuels; prescribed fire; favoring seral, fire-resistant species such as ponderosa pine, and western larch; and developing or maintaining fuelbreaks. Silvicultural options to protect moist grand fir, mesic western hemlock, and wet forests include treating adjacent drier forest stands as described above; and developing or enhancing fuelbreaks.

4. Northern Spotted Owl

The following is the discussion and results of the within LSR Spotted Owl Module for the Upper Nile LSR/Haystack MLSA. This module reviews the home range sites for spotted owls, as well as connectivity within the LSR. See appendix for order, explanations and process of modules. See Suitable Spotted Owl/Dispersal Habitat and Activity Center map and tables, Forest Interior Map and tables, Riparian Reserve map and tables and Security Habitat map and tables.

a) Suitable Spotted Owl Habitat

The Upper Nile LSR has 6,136 acres (67%) of nesting/roosting/foraging habitat, of that 6,053 acres are in the wetter vegetation type and have a high chance of sustainability. There is a potential for the LSR to have 7,354 acres (80%) in suitable. The most contiguous (sustainable) suitable spotted owl habitat in the LSR is in the upper portions of the LSR, headwaters streams. To meet the recovery goals for the spotted owl, there is a need to increase/accelerate spotted owl habitat, especially accelerating old plantations.

The Haystack MLSA has 9,998 acres (41 %) of nesting/roosting/foraging habitat, of that 5,348 acres are in the wetter vegetation type and have a high chance of sustainability. There is a potential for the MLSA to have 17,665 acres (72%) suitable, but most of this would be in drier vegetation types. The most contiguous (sustainable) suitable spotted owl habitat in the MLSA is in the northwest portion of the MLSA. To meet the recovery goals for the spotted owl, there is a need to increase/accelerate spotted owl habitat, especially accelerating old plantations.

This LSR/MLSA is part of the reserves that are predicted to provide the needs for spotted owl recovery over time (50+ years). Coupled with the LSR/MLSA management, riparian reserve function, Wilderness areas, and Unmapped LSRs, the needs of the spotted owl will be met. The reserves function for connectivity and spotted owl home ranges. With the exception of a few LSR/MLSAs that are not sustainable, it is concluded that the LSR/MLSA reserves on the Wenatchee National Forest meet the function of the CHU system, as intended in the NWFP (NWFP C-9). Monitoring and maintaining connections, as well as meeting LSR goals will be ongoing. (See Appendix 1, "Forest-wide Spotted Owl Module" and "Individual LSR/MLSA Spotted Owl Module")

b) Spotted Owl Home Ranges

The Upper Nile LSR will manage for spotted owls over risk in the wetter forests, and have a home range of 60% of 1.8 mile radius, which is 3,994 acres. In drier forests of the LSR, owl habitat will be at 40% threshold, which is 2,663 acres.

The Haystack MLSA will manage for risk over spotted owls, in that threshold acres (40% of the home range) will be managed for.

A total of ten spotted owl activity centers are known within the Haystack and Upper Nile. Eight of these are within the Haystack MLSA and two within the Upper Nile LSR. Currently six (60%) of these activity centers are below habitat thresholds, three (30%) are at threshold and one (10%) is above threshold.

One owl site is at target (wet owls) and threshold (dry owls) amounts. Those wet sites over 3,994 acres are: SO862. Those dry sites over 2,663 acres are: 0. However, 4 sites need to be monitored and field habitat verified, which are over threshold in 2,663 acres but under within the .7 mi. 500 acres, these are: SO806, SO846, SO879, SO 883.

There are 6 dry owl sites, making this a partial risk for long term sustainability in the dry forests, if the wetter forests are not allowed to recover. There is great potential to restore sustainable habitat in

the wetter forest groups for long-term population viability. There is also a need to protect existing habitat and home ranges, especially in sites below threshold and target acreages. Overtime, it is expected that higher quality and more sustainable habitat will be restored to LSR. The drier forests will eventually be managed for other late-successional species.

Table II-9, Suitable Spotted Owl Habitat, Upper Nile and Haystack

	SUITABLE SPOTTED OWL HABITAT[10]											
	1.8 mile Circle Around Activity Center				0.7 mile Circle Around Activity Center				.33 mile Circle Around Activity Center[11]			
Spotted owl	Dry	Mes-ic	Wet	Total	Dry	Mes-ic	Wet	Total	Dry	Mes-ic	Wet	Total
SO814	462	0	2,675	**3,137**	21	0	536	**557**	3	0	155	**158 map**
SO862	65	0	4,206	**4,270**	24	0	630	**655**	10	0	109	**119 m**
SO863	179	0	3,765	**3,944**	23	0	623	**645**	0	0	178	**178 map**
HAYSTACK												
SO806	1,435	0	1,611	**3,046**	336	0	25	**361**	107	0	1	**109 mpa**
SO814	462	0	2,675	**3,137**	21	0	536	**557**	3	0	155	**158 map**
SO846	1,292	0	1,607	**2,898**	199	0	147	**347**	61	0	27	**89 mpa**
SO866	1,360	0	1,778	**3,138**	145	0	439	**584**	40	0	112	**152 map**
SO868	1,072	0	622	**1,694**	170	0	0	**170**	66	0	0	**66 mpa**
SO879	1,516	0	1,190	**2,707**	246	0	238	**485**	77	0	40	**117 mpa**
SO883	1,613	0	1,244	**2,857**	286	0	139	**425**	69	0	3	**72 mpa**
SO890	1,535	0	948	**2,483**	251	0	96	**347**	54	0	53	**107 mpa**

[1] Near the LSR or MLSA but not inside the LSR or MLSA.

[2] This spotted owl is inside Haystack MLSA but is close to Upper Nile LSR.

[3] RS = Residential Single; P = Pair; PY = Pair with Young, based on highest occupancy.

[4] FS = Forest Service; PVT = Private Ownership (ownership at activity center).

[5] If the majority of suitable spotted owl habitat in .7 mile circle is dry or mesic, then it is a dry spotted owl. If the majority is wet, then it is a wet spotted owl..

[6] **Below Threshold**: < 2,663 total suitable spotted owl habitat acres in 1.8 mile circle or < 500 total suitable spotted owl habitat acres in 0.7 mile circle.

At Threshold: 2,663-3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

Optimum/Target: > 3,994 total suitable spotted owl habitat acres in 1.8 mile circle.

[7] The activity center is within 1/2 mile of the CHU.

[8] **Inside** = activity center is at least 600' inside (forest interior) late successional habitat.

Near = activity center is inside late successional habitat near forest interior.

[9] Habitat within 1.8 mile circle around activity center. Dry dispersal habitat includes vegetation codes 11, 13, and 52; mesic includes code 21; and wet includes codes 31, 35, 61, and 41.

[10] Dry suitable spotted owl habitat includes vegetation code 12 where size/structure is multistory greater than 9" DBH; mesic includes code 22; and wet includes codes 32, 36, 62, 64, and 42.

[11] A larger circle will be needed if there is less than 100 acres of suitable habitat

Restoration Opportunities: "m" Monitor site; "a" Accelerate habitat around site and home range; "p" Protect what nesting/roosting/foraging habitat exists.

c) Spotted Owl Dispersal And Connectivity

During dispersal, nesting, roosting, foraging habitat is used, as well as habitat of lower quality (dispersal habitat). Dispersal habitat includes single story stands, and smaller trees with at least 40% crown closure. Dispersal habitat within the Upper Nile LSR is 523 acres (6%) and will grow up to be nesting/roosting/foraging habitat. Dispersal habitat within the Haystack MLSA is 9799 acres (40%). Habitat providing dispersal/Connectivity corridors and patches within the LSR/MLSA are identified on the Forest Interior map and Suitable Spotted Owl Habitat Map.

Outside the LSR/MLSA network, dispersal habitat is found in all land allocations, and will be provided mainly in Riparian Reserves, in Unmapped LSR's in Matrix and in AMAs, and in wilderness areas (NWFP 1994, Ch 3-4 pg. 240-241).

d) Restoration Opportunities And Potential Projects

Restoration activities could include the use of silvicultural practices to promote the development of suitable spotted owl habitat within currently non-suitable habitats. The risk of habitat loss due to disturbances could be reduced by lowering fuels in non-habitat or high risk suitable habitat. Habitat effectiveness and connectivity could be improved through road closures and revegetation of the road bed. This would be especially effective in the areas identified as forest interior.

1. Improve and accelerate N/R/F habitat, to maintain high number of spotted owl pairs. (see individual owl restoration opportunities.
    - Clear cuts in wet/moist vegetation groups predicted to be habitat in 100 years.
    - Pole sized stands in wet/moist will be habitat in 50 years.
    - Clear cuts in mesic/dry vegetation groups will be habitat in 120 years.
    - Pole sized stands in mesic/dry will be habitat in 70 years.
2. Aggressive protection of remaining suitable spotted owl habitat, from outside LSR/MLSA, on Matrix lands.
3. Protect spotted owl home ranges within LSR/MLSA, between owl circles, by implementing risk reduction on first on non-suitable habitat, then on Dry and Mesic habitat:

4. Fuels reduction and hazard reduction occur outside N/R/F habitat in short term, shift emphasis in 50 years.
5. Monitor/maintain connectivity outside LSR.
6. Monitor spotted owl activity centers, 500 acre core and home ranges of owls below threshold or target acreage (see list).
7. Field verify habitat within 500 acre home ranges of spotted owl sites below threshold in that core, but above threshold in the home range.
8. Increase habitat effectiveness and connectivity by reducing open roads and revegeting road beds. Especially in forest interior habitat patches.
9. Maintain dispersal/connectivity habitat.

5. Aquatic

a) Summary of Aquatic Goals

- Protect salmonid populations and habitat in core areas Mainstem Naches subwatershed.
- Prevent increase in water temperature in lower Nile-Dry and Mainstem Naches subwatershed's.
- Reduce water temperature in Naches drainage.
- Minimize fine sediment input.
- Increase LWD recruitment potential in upper end of the Mainstem Naches subwatershed.
- Reduce groundwater to surface water conversion by roads.
- Evaluate road surfacing and maintenance with an emphasis on reducing sediment input.
- Reduce or avoid increase in riparian roads.
- Manage upslope vegetation, roads and activities to increase base flows, and to avoid increase in peak flows, in the Naches and Rattlesnake basins.
- Preserve and restore all floodplain, side channel, and riparian wetland habitat, especially in C and E channel types in the Naches drainage.
- Protect and inventory upslope wetlands and ponds.
- Restore natural disturbance regimes (landslides, fire, flood, disease) as practicable.
- Discourage the spread of brook trout.
- Gather more information on non-salmonid aquatic biota.

b) Key Issues

1. Core fish areas have been identified within and downstream of Haystack MLSA / Upper Nile LSR. Within the Nile-Dry subwatershed is a core area for cutthroat trout and the Mainstem Naches is a core area for spring chinook salmon. Downstream in the mainstem Naches section below Haystack MLSA / Upper Nile LSR populations of spring chinook salmon and bull trout are found.
2. Federal candidate species and other species of concern: bull trout populations in the Naches mainstem could be impacted by LSR/MLSA management activities.

3. Anadromous salmonid populations occur within and below Haystack MLSA / Upper Nile LSR. Anadromous salmonids within the LSR/MLSA include: steelhead, early-run (spring) chinook salmon.

   Concerns include the lack of abundance of anadromous fish populations which are severely reduced from historic levels, within-population genetic and life-history diversity, condition of physical habitat and condition of water quality for incubation, rearing, over-wintering, migration, and spawning. Direct human interaction or harvest of individuals may potentially reducing fitness of the spawning population. All life stages are probably vulnerable to impacts that are caused by management actions.

4. Resident salmonids. Redband/native rainbow trout occur throughout the LSR/MLSA. Cutthroat occur in substantial numbers, with Nile-Dry being a core area for cutthroat.

   Concerns include maintaining existing populations, protecting against habitat degradation, over-harvest, and non-natives.

5. Introduced species. Eastern Brook trout are known to occur in Devil-Swamp, Nile-Dry, Mainstem Naches, Lower Rattlesnake subwatershed's, and may occur in the North Fork Rattlesnake subwatershed.

   Brook trout can have a deleterious genetic impact on bull trout, and may impact other natives through competition for food or habitat. Habitat changes or other management that would favor brook trout over native species, or would encourage the spread of brook trout, should be avoided.

6. Non-salmonid aquatic biota: We have little data for other aquatic biota in the area. Mountain White Fish and Sculpins (Cottus sp.) utilize stream with the LSR/MLSA. There are locally recorded sightings of aquatic amphibians within the LSR/MLSA. No sightings have been recorded for aquatic mollusks. No systematic surveys for mollusks, nor amphibians have been undertaken in this LSR/MLSA.

7. Water temperature. Within the Naches River drainage, it is important to avoid any increase in water temperature, and to lower water temperatures where possible. Maximum temperature in the Naches mainstem are recorded as reaching 69.6 degrees F. These temperatures exceed forest plan standards (max. temperature 68 F, Wenatchee National Forest 1994 monitoring report) and likely lower the fitness of the Naches's anadromous populations. Maintaining water temperature at or below the current level may be important for maintenance of the core cutthroat population in the Nile-Dry subwatershed.

   Maximum temperatures recorded during 1990, 1992-1994 temperature monitoring included some of the streams in the Haystack MLSA / Upper Nile LSR area. Glass creek averaged a maximum of 56.6 degrees F. over the period, Lower Nile creek 58..3 F., Upper Nile creek 55.0 F. and Orr creek 56.6 F.

   Managing for lower water temperatures in the LSR/MLSA could include managing summer low flows, and/or groundwater - surface water partitioning. This could be accomplished by managing riparian and upslope vegetation, soils and roads.

8. Fine sediment. An increase in sediment load is often the most important adverse effect of forest management activities on streams. Large increases in the amount of sediment delivered to the steam channel can greatly impair, or even eliminate, fish and aquatic invertebrate habitat, and alter the structure and width of the stream banks and adjacent riparian zone. Sediment levels are a concern because they can cause failure of redds; increased suspended sediments will reduce the

penetration of light and can reduce primary production, increase heat absorption, delay initiation of bedload transport.

Bedload is the material transported downstream by sliding, rolling, or bouncing along the channel bottom. Bedload is an important component of the total sediment load of a stream; it can determine the amount of micro habitat available for juvenile fish and invertebrates. Large amounts of easily transported bedload tend to fill in pools and reduce the larger-scale features that are important habitat. In general the courser material provides more habitat space, where as fine sediments tend to fill up the interstitial spaces between larger particles.

There are at least common causes of sediment entering streams: roading, recreation, human settlements, timber harvest, fire, grazing, mass wasting and mining. Opportunities for all eight types of sediment input exits within or upstream from the LSR/MLSA. No fine sediment data is available within Haystack MLSA / Upper Nile LSR.

Sediment transport. Haystack MLSA / Upper Nile LSR lie primarily in a region of sediment input and transport; the mainstem Naches below Haystack MLSA / Upper Nile LSR has a wider floodplain at some sites and can act as a region of sediment deposition. Fine sediment data is only available for the American River and portions of the Little Naches River, which are tributaries to the Naches. Fine sediments in the three tributaries of the Little Naches were sampled and had moderate to high concentrations of fine sediment. The American River is within Wenatchee Forest Plan standards all twelve samples.

9. Channel complexity. Channel complexity has implications for fish habitat and for the hydrologic regime (hydraulic retentivity). Components of channel complexity include: large woody debris (LWD), pool abundance, pool type, pool depth, width:depth ratio, substrate diversity, sinuosity, cover, undercut banks, bank vegetation, riparian vegetation, roughness coefficient, hydraulic retentivity, riparian wetlands, side channels, high flow refugia, and floodplain connectivity.

LWD plays key roles in streambed and streambank stability, fines/gravel retention, sinuosity, pool formation, side channel creation, nutrient retention (e.g. deciduous leaves, salmon carcasses), and nutrient input. Single pieces function differently from interwoven masses of LWD known as complexes.

Input mechanisms: small scale riparian disturbances to large scale hillslope disturbances. Management can impact aquatic LWD regimes in a number of ways including: removal from channel; removal from floodplain (down and/or potential); alteration of floodplain area or of frequency of "small" floods; removal from hillslope; or alteration of disturbance regimes controlling input (landslides, avalanches, fire, flood, disease).

Riparian road density is often inversely related to channel complexity. Our information on channel complexity is far from complete; riparian road density and LWD and pool abundance data is available for selected (R6 protocol - surveyed) streams.

The Naches River receives the majority of LWD from upstream. The 1992 stream survey reported a deficiency of LWD in the Naches River for the section surveyed. Approximately half of the amount needed to meet Wenatchee Forest Plan standards was found. The above levels of LWD were influenced by in-channel removal of LWD following the flood of December 1977. During 1979 inchannel LWD was removed from the upper portion of the Naches Mainstem and burned on gravel bars. Some additional loss of inchannel LWD occurred as a result of firewood gathering. Normal channel

actions of the river moving in its floodplain have improved the condition especially during 1995 and 1996.

10. Aquatic nutrient cycling depends in part on riparian understory vegetation, groundwater /surface water partitioning, in-channel LWD, hydraulic retentivity, pool depth and character, macroinvertebrate community structure, mass wasting disturbance regime, and returning anadromous biomass. We have inadequate data to evaluate aquatic nutrient cycling in Haystack MLSA / Upper Nile LSR at this time; however we can be aware of it when managing any of the above inter-related factors.

11. Landtype. Haystack MLSA/Upper Nile LSR includes landtypes E and F (seeLandtype Association Responses Map)

12. Channel type. In the absence of human influence, valley shape and geology determine the basic character of the stream channel. A steep boulder torrent, a moderate but continual step - pool - step, a broad meandering river, or a cliff-lined canyon, present different opportunities for aquatic biota. A given organism might require a number of different channel types for different aspects of its life. Various classification systems, such as Rosgen, have been constructed to characterize these differences. Common and fundamental to all systems are: 1) channel gradient, 2) channel confinement (the ability of the stream to move back and forth, or express sinuosity, often quantified as the width of the valley floor relative to the width of the channel), and 3) substrate size (whether the local geology provides huge boulders, moderate cobbles, or only sand and silt to the channel).

    Channel type is a fundamental constraint on many other aquatic habitat parameters. The pools found in a steep boulder torrent will be fundamentally different from those in a broad meandering river in abundance, type, and depth. Human influences can alter conditions within a channel type (a meandering river could become shallower, silt filled, and lacking in riparian cover) or the channel type (a deep winding meadow trout stream could become a downcutting gully). If the channel type itself has been altered. It may never be possible to return a stream to its original condition ; however it may be possible to improve the channel condition that moves it toward the characteristics of the original, or at least stabilizes the channel (for example prevent further downcutting).

    Channel types vary not only in their natural character (or range of variability of key parameters) but vary also in which human actions they respond to, the degree of their response, and how the response is manifested

    An historic/current channel type analysis of Haystack MLSA / Upper Nile LSR needs to be done. As a broad generalization, "A" (high gradient) channel types may present the greatest slope failure concerns, "B" (moderate gradient) channel types may be most stable and most resistant to management impacts and "C" and "E" (low gradient) channel types may be the most sensitive to on-site or upstream management impacts. C and E channel types provide key unique habitat for salmonids and other biota.

    Meadows adjacent to C and E channel types may be priority for riparian road removal, human recreation reduction, and reduction in riparian grazing impact.

13. Peak flows. Floods have been a concern in the Naches basin, particularly where humans have build roads, residences and other improvements within the floodplain. The rain on snow floods of 1995/96 caused much damage to human habitat elements. Aquatic habitat for other organisms was improved over all. Some moderate peak flow events are necessary to maintain the substrate and channel conditions required by salmonids and other biota.

Protection of C and E channel meadows, side channels, and other floodplain areas, and careful upslope (vegetation, soil, wetland, road, grazing and recreation) management will help mitigate peak flow impacts on humans.

Peak and low flows in the Mainstem Naches subwatershed have been modified by the influences of the Bumping Dam, that is upstream of the LSR/MLSA area.

14. While normal low flows are necessary for salmonids and other biota, extreme low flows can strand organisms, reduce habitat, create passage barriers, reduce water temperatures, and reduce the stream's ability to transport fine sediments. The management factors above that mitigate peak flows will also mitigate low flows.

15. Water withdrawals. Because of regulation of water upstream at Bumping dam and water withdrawn from the Naches during the summer for agriculture there is a potential for lower base flows, increasing water temperatures and fine sediment levels at key times and places for anadromous spawning, other management in the basin that impacts base flow, fine sediment, and water temperature, takes on heightened significance. The Bureau of Reclamation regulates the spill of water from both Bumping and Rimrock Dams and they adjust the flow rate to meet a variety of need. Flow amount in the Naches and Tieton rivers can vary by the day.

16. Road density. Road density is related to many other issues including fine sediment, mass failures (biotic passage barriers, coarse sediment input, LWD input), effective channel network (increased), hydrograph (peak flows, low flows, water temperature, biotic migration/passage, water/sediment balance, aggradation/degradation), groundwater/surface water partitioning (areas of groundwater upwelling have been documented as key winter thermal refugia for salmonids and may support unique flora/fauna; this is also a water temperature issue). Riparian roads have additional issues of floodplain loss, channel constriction and simplification and human presence (potential harvest, disturbance of spawning, habitat degradation, introduction of non-natives).

    Total riparian road density in Riparian Reserves are 2.28 miles per square mile in Haystack MLSA. The Riparian Reserves are estimated as 6,832 acres (13%) of the 76,502 acres within Haystack MLSA. Upper Nile LSR supports a total riparian road density of 2.19 miles per square mile. The Riparian Reserve is estimated as 1,108 acres (12%) of the 9,191 acres within Upper Nile LSR.

    Road management strategies include: 1) relocating riparian roads, 2) reducing the abundance of upslope roads to leave only a well planned core access network, and 3) reducing road-related surface erosion through such actions as frequent maintenance, surfacing, outsloping, drivable dips, seasonal closures cut-and-fill plantings or coverings, and culvert replacement or maintenance. These management actions are predicted to lead to immediate, long-term, widespread "improvements." Allowing the Riparian Reserves to returns towards the natural condition of the water/sediment balance, fine sediment abundance, channel complexity, riparian health, and water temperature. Because of a high probability of improvement, and because these are fundamental parameters within which finer scale parameters (such as spawning gravel condition or pool abundance and depth) operate, road repair is generally a management action of high priority, high return, low risk, and nearly universal applicability.

17. Upslope vegetation has profound importance for the yearly streamflow pattern (hydrograph), affecting peak flows, low flows, and total yearly flow, as well as the timing of these flows. Percent canopy closure, or clear-cut acres, are measures often used to address this issue. Human management may have reduced canopy in the watershed (usually through timber harvest) or

increased canopy in the watershed (usually through fire exclusion). Overstory canopy may have the greatest effect but understory vegetation, condition of the duff layer, and soil compaction are inter-related and also important, particularly in areas of drier climate. Vegetation, climate (precipitation patterns, rain-on-snow probabilities, and lightening strike patterns), and landtype interact

> The Mainstem Naches and Wenas Watershed Assessment of 1995 assessed timber harvest in the riparian zone as having harvested 2.62 miles of stream bank in Devil-Swamp subwatershed, 8:03 miles in Nile-Dry and Mainstem Naches subwatershed's respectively.

18. Floodplain connectivity. Historic photos might reveal changes in off-channel habitat, floodplain area and riparian wetland habitat over time. Some of the floodplain area along the Mainstem Naches is privately owned. Habitat improvement projects on National Forest land have been constructed to create offchannel habitat have been successful in the recent past. Within the LSR/MLSA some of the floodplain area has been altered, see discussion of timber harvest within the riparian zone and riparian roading above.

19. Upslope wetlands and ponds may serve as "islands" and/or refugia for aquatic biota, especially those that do not co-exist with salmonids. They also have important roles in regulating summer base flows in the watershed. We have information regarding wetland locations, but little understanding of alterations in their ecosystem functions over the recent centuries.

> As a broad generalization wetlands, especially in late-successional forests may be havens of biodiversity warranting very conservative management until better inventoried and understood.

20. Disturbance Regimes. We have come to recognize that suppression or alteration of natural disturbance regimes can lead to fundamental long-term resource change. This in turn has led to the realization that minimum viable populations or habitats must be large enough to withstand moderate disturbances. A complete description of natural disturbance regimes, their relationship to landtype, climate, and other factors, and their ecosystem roles, is still lacking. Aquatic systems are now seen to depend on disturbance by fire, flood, insect/disease, and landslides for input of the raw materials of channel construction, such as LWD and coarse substrate

> In the Naches basin a high priority may be upslope and riparian hydrologic management to prevent disturbances from impacting human resources through flooding.

The LSR/MLSA system comprises a set of landscape patches where retention or recreation of primeval conditions is emphasized, allowing the maintenance of wildlife dependent on these conditions. From the aquatic perspective, we consider how this system of reserves and the aquatic corridors that link them can be managed for maximal viability of native aquatic species and the habitat conditions in which they evolved.

Although historic aquatic conditions are not known to the degree desirable this much is clear: many aquatic populations have lost some of their spatial, temporal, and genetic "safeguards;" the nature of the disturbances they experience has changed; individual health/reserves may be reduced (for example salmon enduring longer migration times concurrent with higher temperatures); and habitat conditions have declined in non-random ways, fragmenting populations. The LSR/MLSA network has the potential to strengthen viability of these at-risk aquatic populations.

6. Noxious Weeds

Eight noxious weed species were identified to occur within the Haystack MLSA/Upper Nile LSR. These species are discussed in priority order as identified on the noxious weed analysis module. No Class A weeds are presently documented from this area. Class B-designate species include: *Linnaria dalmatica* and *Chrysanthemum leucanthemum. Linaria dalmatica* is widespread within the Haystack MLSA, particularly within the dry vegetation group. Infestation of this species is most severe on private lands within the MLSA. Furthermore, several main travel routes and summer home areas have been invaded, as well. Following through the noxious weed analysis (Appendix 1), control/eradication efforts for this species should focus on roadways, specifically, Highway 410 and Roads 1703, 1704, and 1705. Cottonwood Campground, which occurs immediately adjacent to the MLSA, is also an area for priority treatment. Other areas with a high priority for treatment include the Gold Creek summer home group, Lost Creek Village and the area in the vicinity of Fontane Flat. *Chrysanthemum luecanthemum* is limited in it's occurrence, known primarily from along isolated open areas and roadways. Control efforts for this species should focus on activities such as hand pulling, herbicides, or a combination of these methods.

Centaurea diffusa was the only Class B weed identified, and would therefore be considered as second priority for treatment. *Centaurea diffusa* is widespread in the Haystack MLSA and occurs less frequently in the Upper Nile LSR. It occurs primarily along roadways and in waste places. Containment and prevention of further spread of this species should focus on major travelways such as Highway 410 and Roads 1601, 1611, 1500 and 1502. The dispersed campground located at the old Nile mill site should also be considered a priority area for treatment.

Five Class C weeds were identified in the Haystack MLSA/Upper Nile LSR. *Cirsium vulgare* and *C. arvense* are widespread and are documented from areas with recent ground disturbance, primarily areas previously harvested and/or heavily grazed by domestic livestock and wildlife. Containment and further spread of these species should focus on areas such as the area near Lindsay Camp, Dry Ridge and Glass Creek. *Hypericum perfoliatum*, *Verbascum thapsus*, and *Convolvulus arvense* are all limited in their occurrence, found as small isolated populations. Hand pulling and spot herbicide spraying, or a combination of these methods should be

7. Fire Management Plan

a) Overview

This plan is intended to provide guidance for the management of fire in the Upper Nile LSR / Haystack MLSA. It is intended to supplement the Fire Management Plan for the Late Successional Reserve System and will become a portion of the Fire Management Action Plan for the Wenatchee National Forest.

The disturbance regimes for the vegetation groups have been described in a separate portion of this plan. It is the intent of this plan to provide adequate protection of the reserve to allow management practices to be initiated which will provide for the protection of the Late Successional Associated species and associated unique habitats. These management actions are expected to include actions which will include the role of fire disturbance as an important process in the reserve.

b) Fire Prevention Actions

The following actions are site specific for the Upper Nile LSR / Haystack MLSA. They are intended to supplement the actions which will be implemented on a Forest wide basis.

1. Continue to implement campfire restrictions as warranted by increased fire danger.

2. Initiate hazard reduction around developed and dispersed recreation sites and organizational camps such as:
    - Lindsay Camp
    - McDaniel Lake
    - Cottonwood
    - Rattlesnake Springs
    - Old mill site at junction of FS Road 1600 and 1601
    - Lost Creek Village
3. Emphasize fire prevention activities along major loop roads and high use dispersed sites such as FS Road 1600 - 1706 and FS Road 1500 - 1502.
4. Continue and improve fire prevention signing program on roads and trails included or adjacent to the LSR / MLSA. Coordinate with entire district signing program.
5. Make public user education geared to fire danger an emphasis item
6. Implement road restrictions and closures as warranted during periods of extreme fire danger.
7. Emphasize contact with the following special interest groups: ORV groups, summer home groups, organization camps, local user groups, grazing permittees, and other special use permittees.
8. As a hazard reduction measure emphasize fuel wood collection around recreation use sites in the dry forest type.
9. Maintain cooperative fire prevention efforts with Yakima County Fire Prevention Association, the local Nile - Cliffdale Fire District, and DNR.

Pre-fire Protection for Fires Originating Outside the LSR / MLSA

The following methods are proposed to protect the LSR / MLSA from fires originating outside Reserve boundaries.

1. Complete pre-attack planning process for LSR / MLSA; utilize natural fuel breaks
2. Stress prevention of fires outside LSR / MLSA boundaries
3. Strategic fuel manipulation to reduce size and intensity of fires within and adjacent to LSR / MLSA boundaries

    e.g. fuel breaks - tie together existing fuel treatment areas utilizing natural openings, roads, ridgetops, etc. Priority area is along the eastern portion of the MLSA north of FS Road 1600 to the ridgeline.
4. Maintain existing pre-attack facilities (water chances) and seek opportunities for more, including helispot locations.

c) Fire Detection -

1. Staffing of Clemans L.O. and aerial detection after lightning episodes will provide the primary detection resource for this LSR / MSLA.
2. This will be supplemented by emergency staffing at Little Bald and Timberwolf during and after lightning episodes.

3. Seek opportunities for fuel-breaks around private lands within the MLSA boundary (Naches River corridor).
4. Work with the local residents, users, and cooperators on education of how to report fires.

d) Fire Suppression

1. Spotted owl activity centers are the highest priority for protection of resources (following protection of human life and improvements). All wildfires in the 1.8 mile buffer will be suppressed at minimum acres.
2. Aggressive initial attack will occur on all dry site ecosystems until vegetation management projects have modified the vegetative condition to where it is in synchrony with inherent disturbance regimes, recognizing the fluctuation in funding levels and the ability to meet the objectives.
3. Tactical suppression activities will take into consideration specific resource values such as the protection of riparian areas and private land from fires.
4. Improvements will be a priority for protection (Dry Evaluation Plantation, recreation facilities, etc.)
5. Pre-planned dispatch cards for initial attack will be prepared for the LSR / MLSA area
6. The FSA and Escaped Fire Situation Analysis process will be used to guide initial attack, Extended Attack, and large fire-suppression. Utilize pre-attack plans and materials.
7. Protect known threatened and endangered species habitat from fire (botanical).
8. Fire suppression actions will be implemented on an inter-agency basis as appropriate.

e) Vegetation and Fuels Management

1. Returning dry forest types to sustainable conditions is a priority
2. Suggested activities include pruning, thinning, commercial and pre-commercial thinning, wood gathering, mechanical treatments, and prescribed fire
3. High density, multi-story refugia in mesic sites will be maintained.
4. Prevent the spread of noxious weeds as feasible
5. Maintain a mosaic of age classes and structural conditions across the landscape outside dry forest to support species associated with late-successional forest

f) Prescribed Fires, Prescribed fire opportunities

1. Recognize the use of prescribed fire as a primary management tool in this LSR / MSLA.
2. The development and subsequent implementation of prescribed fire plans should be on a landscape level both within and adjacent to the LSR/MLSA
3. Priorities for the use of prescribed fire are dry site ecosystems including dry meadows and steppe vegetation
4. Priority outcomes are hazard reduction and vegetation manipulation throughout the LSR / MLSA
5. To return landscapes to synchrony with inherent disturbance regimes, peruse opportunities to implement prescribed fire projects in a timely and economical manner

6. Projects should attempt to minimize risk of future catastrophic wildfires (those outside the range of inherent disturbance regimes with respect to size and/or severity)

g) Summary:

Fire prevention, suppression, vegetation and fuels management, and prescribed fire are all appropriate, integral elements of the overall management of this LSR / MLSA.

D. Restoration Opportunities and Potential Project Summary

Table II-10, Restoration Opportunities and Potential Projects, Haystack MLSA, Upper Nile LSR

Analysis Module	Restoration Opportunity	Potential Projects	Schedule[1]
Forest-Wide Sustainability	1) Reduce fuel loading and stocking levels in dense successionally advanced dry forest stands where they exist between Haystack/Upper Nile and Neighboring LSR/MLSA's. Focus on areas between Haystack/Upper Nile and Milk creek and Rattlesnake LSR/MLSA's.	1) Use commercial thinning, pruning, fuelwood collection and prescribed fire as described in disturbance module treatment key. Favor the development of seral species such as ponderosa pine and western larch. Locate and prescribe sufficient treatments to make landscape level changes in fire susceptibility.	A
	2) Reduce fuel loadings along roads that exist between these LSR's to increase the roads effectiveness as a fuelbreak.	2) Piling of down fuels, firewood gathering, pruning to reduce vertical fuel continuity, construction of shaded fuelbreaks.	B
	3) Reduce fuel loadings in young stands.	3) Precommercial thinning	C
Forest-Wide Spotted owl	Not Applicable		
Forest-Wide Connectivity	No opportunities identified		
Unique Habitats and Species	1) Reduce road densities in riparian reserves and in talus areas.	Close or relocate roads as opportunities are identified in Access and Travel Management Planning.	A
	2) Maintain existing subalpine meadows.	2) Remove encroaching conifers from meadows.	C
	3) Increase the amount of interior forest area within the	3) Close roads near interior forest areas as opportunities are identified	A

Analysis Module	Restoration Opportunity	Potential Projects	Schedule[1]
	LSR.	through Access and Travel Management Planning.	
	4) Retain whitebark pine acreage within the Upper Nile LSR.	4) prescribed fire.	C
Connectivity Within the LSR	1) Reduce road densities in riparian reserves to improve connectivity for low mobility species that use these areas.	1) Close roads in riparian reserves as identified in Access and Travel Management Planning, revegetate disturbed areas.	A
Disturbance	1) Reduce the risk of habitat loss to wildfire by reducing stand density, altering species composition and reducing vertical and horizontal fuel continuity in the following forest types. (**Dry Forest:** Vegetation Type #12 - Dense Successionally Advanced, #13 - Partial Cut; **Moist Grand Fir:** #32 - Layered/Mature, #33 - Partial Cut; **Mesic Western Hemlock:** #36 - Layered Mature, #37 - Partial Cut)[2]	1) Use commercial thinning, pruning, fuelwood collection and prescribed fire as described in disturbance module treatment key. Favor the development of seral species such as ponderosa pine and western larch. Priority areas for treatment of this stand type are: 1) Outside the LSR to the south and west, 2) Within the LSR but outside of activity centers. 3) Over threshold acres within the activity center. 4) See item 5 under spotted owls for treatment of threshold acres.	A
	2) Minimize the extent of stand replacement fires within the LSR/MLSA.	2) Conduct activities that improve the effectiveness of the existing road system as fuelbreaks, focus on highway 410 corridor.	B
Spotted Owl	1) See Appendix 39, Northern Spotted Owl Nest Site Protection Within LSRs and MLSAs.		A
	2) Maintain 500 acres of nesting habitat within the 11 Haystack /Upper Nile spotted owl circles.	2) No Ground or vegetation disturbing activity in spotted owl nesting area, all are at or below minimums.	A
	3) Improve sustainability of dense stands (type 12) outside of 1.8 mile spotted owl circles but within the LSR/MLSA.	3) Use commercial thinning pruning and fuelwood collection.	A
	4) Improve sustainability of	4) Use commercial thinning up to	A

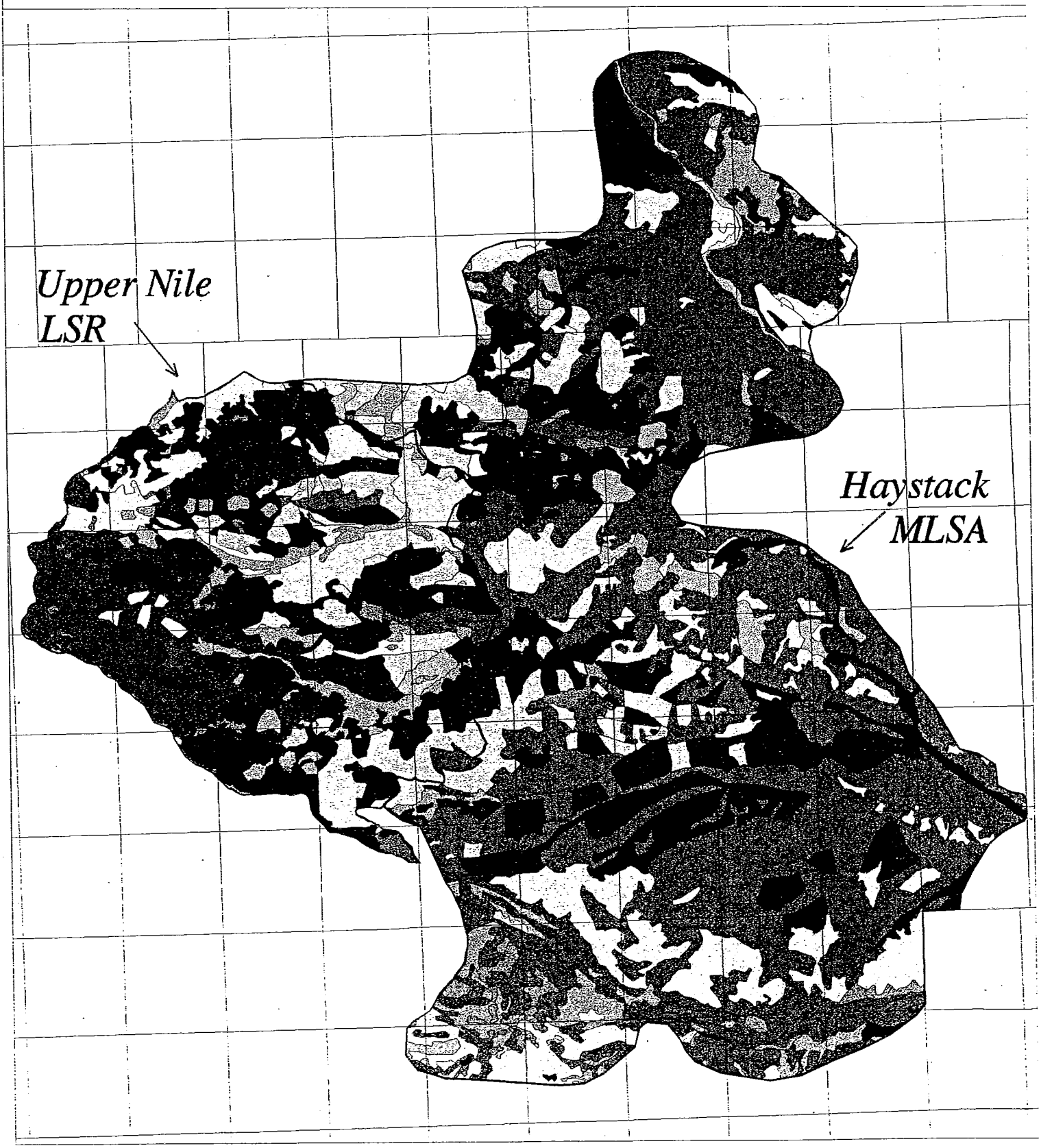
Analysis Module	Restoration Opportunity	Potential Projects	Schedule[1]
	dense stands in spotted owl circles 806, 846, 879, and 883.	the following acreages within 1.8 mile spotted owl circles; 806-383 ac., 846-235 ac., 879-44 ac., and 883-194 ac.	
	5) Improve sustainability of dense dry forest (vegetation Type 12) within 0.7 to 1.8 mile home range area on threshold acres. Treatment should maintain suitability of habitat for nesting, roosting and foraging. (see spotted owl desired conditions)	5) Utilize commercial thinning, pruning and fuelwood collection.	A
	6) Improve habitat quality in dense single story stands in spotted owl circles 814 and 866.	6) Utilize silvicultural activities that accelerate the development of multi-layered stands. Focus on single layered pole size stands in moist grand fir and wet forest groups.	C
	7) Obtain information on spotted owl locations.	7) Survey areas to 1994 spotted owl protocol.	B
Aquatic	1) See goals listed in Aquatic section for Haystack/Upper Nile.	1) Coordinate projects with Mainstem Naches Watershed Assessment.	
Noxious Weed	1) Limit the extent and spread of *Centaurea diffusa* which occurs primarily along roadways in the Haystack MLSA and is less abundant in Upper Nile..	1) Consider treatments such as hand pulling and herbicides to limit extent and spread. Focus should be along highway 410, roads 1601, 1611, 1500, and 1502, and at the old Upper Nile mill site.	B
	2) Control or eradicate Linaria dalmatica.where it occurs within Haystack/ Upper Nile	2) Use combination of treatments such as hand pulling, and spot herbicide application to eliminate these populations. Focus on highway 410, roads 1703, 1704, and 1705. and Cottonwood campground.	A
	3) Increase knowledge regarding noxious weed presence in Haystack and Upper Nile.	3) Survey LSR/MLSA for presence of noxious weeds.	C

Analysis Module	Restoration Opportunity	Potential Projects	Schedule[1]
Fire Plan	1) Protect LS values from loss due to wildfire	1) See fire plan for specific actions	

1 Implementation Schedule; (A) = within 1 year; (B) = within 3 years; (C) = within 5 years

2 Refer to "LSR Vegetation Photo Mapping Key" in the Appendix for further information on vegetation types.

Vegetation in Haystack MLSA and Upper Nile LSR



04/25/96

Haystack Managed Late Successional Area and Upper Nile Late Successional Reserve

UNIQUE HABITATS

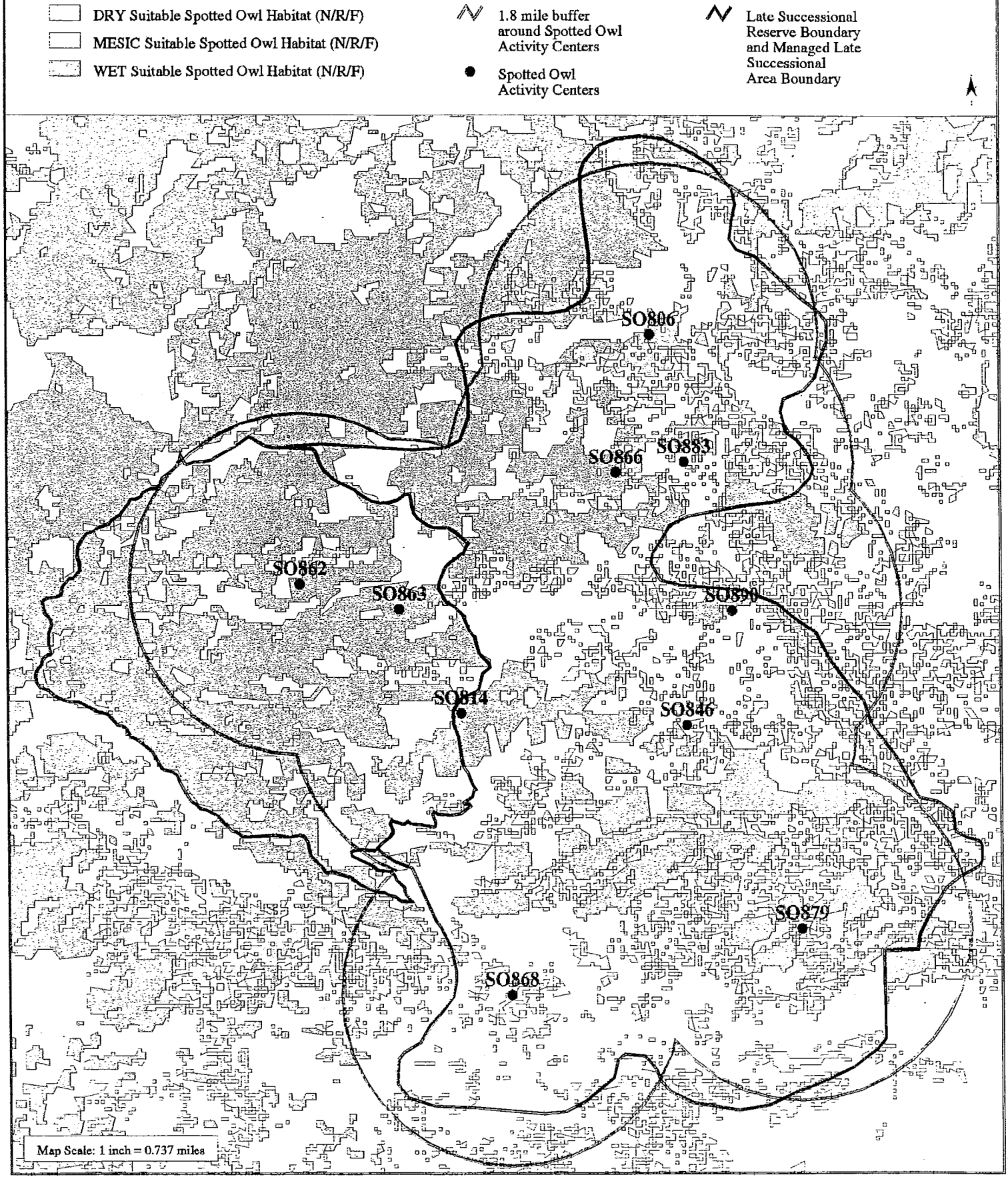
- Large Forest Interior Patches
- Whitebark Pine
- Talus, Scree, Bedrock, Cliff
- Meadows
- Natural Opening
- Shrub
- Deciduous Forest
- Wenatchee Forest Plan Allocations RN1, SI1, SI2
- Riparian Reserves
- Lakes and Wetlands
- Streams
- Spotted Owl Activity Centers
- Wildlife PETS
- Late Successional Reserve Boundary and Managed Late Successional Area Boundary

Map Scale: 1 inch = 0.737 miles

04/25/96

Haystack Managed Late Successional Area and Upper Nile Late Successional Reserve

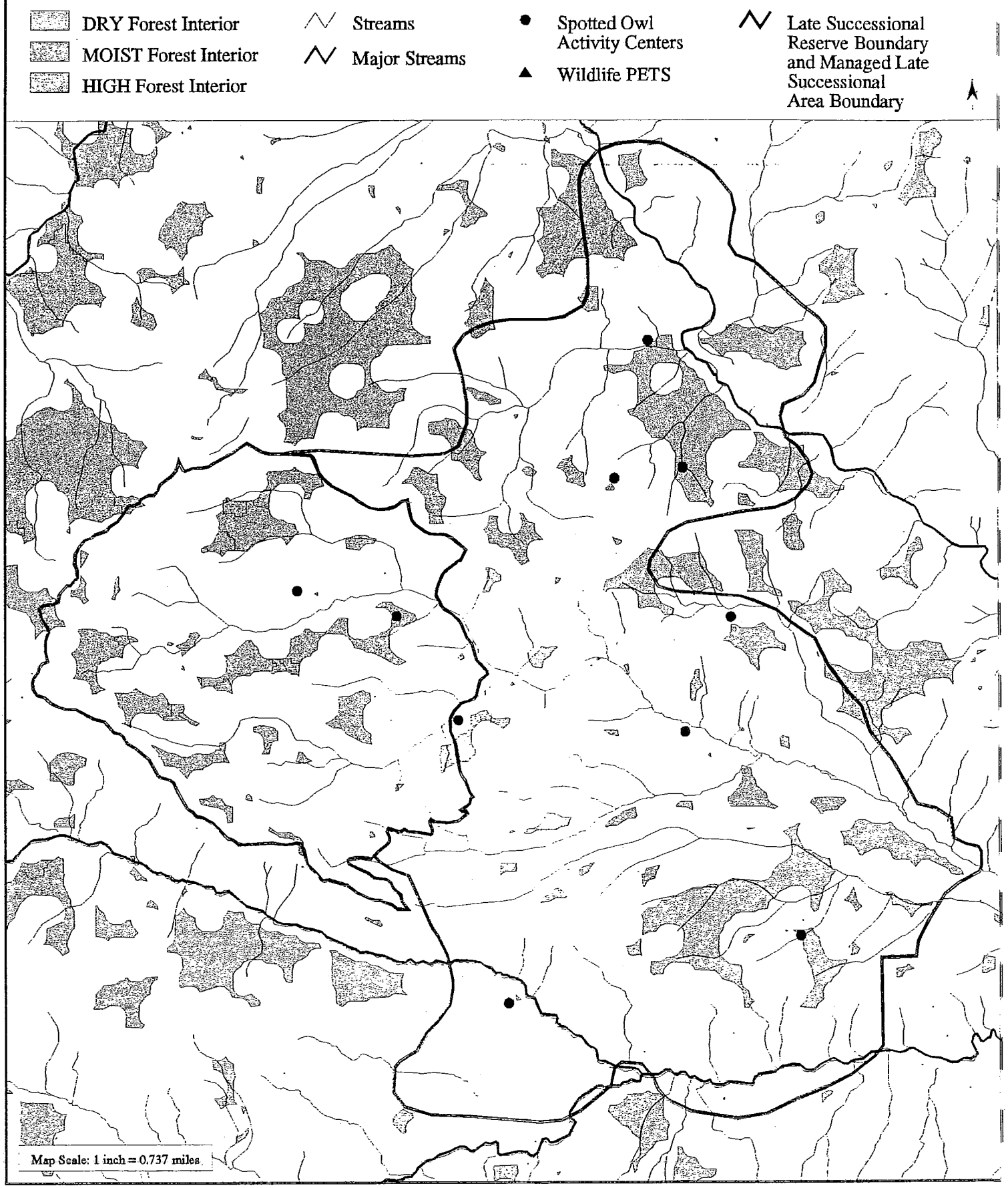
SUITABLE SPOTTED OWL HABITAT



04/23/96

Haystack Managed Late Successional Area and Upper Nile Late Successional Reserve

FOREST INTERIOR



04/25/96

Haystack Managed Late Successional Area and Upper Nile Late Successional Reserve

SECURITY HABITAT

Security Habitat

NOT Security Habitat

Major Streams

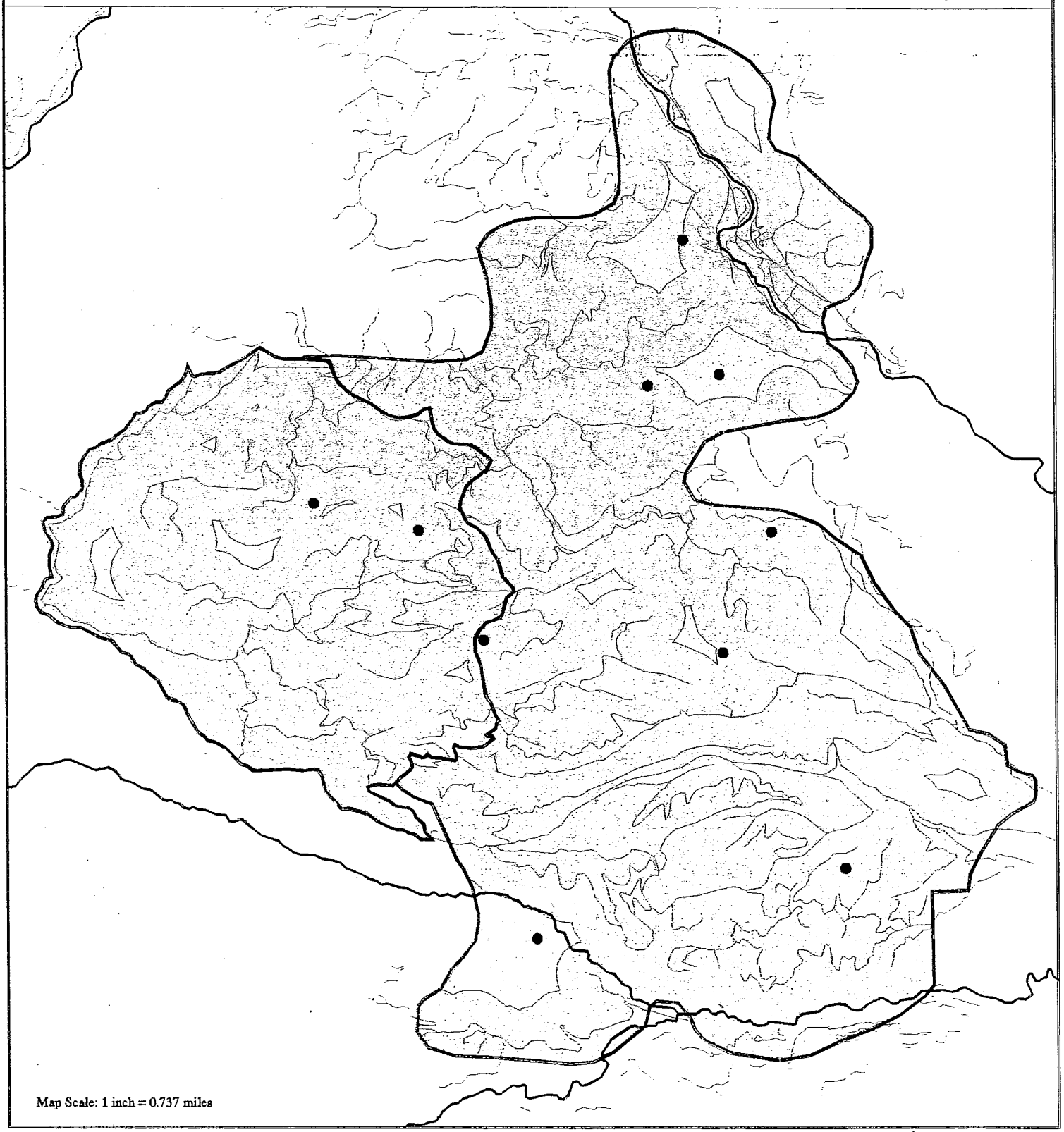
Open roads and motorized trails

Closed roads and non-motorized trails

Spotted Owl Activity Centers

Wildlife PETS

Late Successional Reserve Boundary and Managed Late Successional Area Boundary



Map Scale: 1 inch = 0.737 miles

04/25/96

Haystack Managed Late Successional Area and Upper Nile Late Successional Reserve

FISH PRODUCTION UNITS (SUBWATERSHEDS)

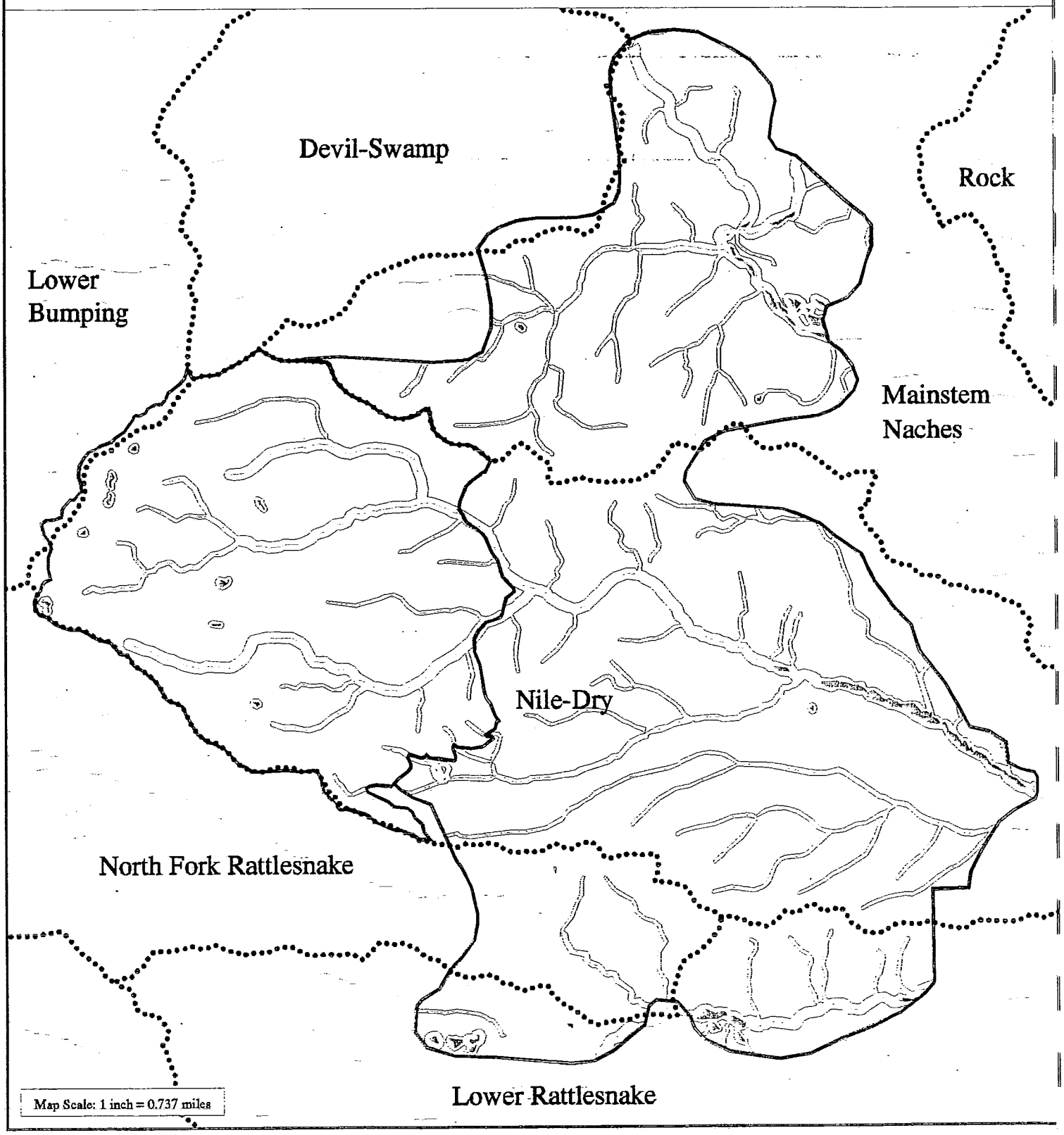
Riparian Reserves

Lakes and Wetlands

Streams

Fish Production Units (Subwatersheds)

Late Successional Reserve Boundary and Managed Late Successional Area Boundary

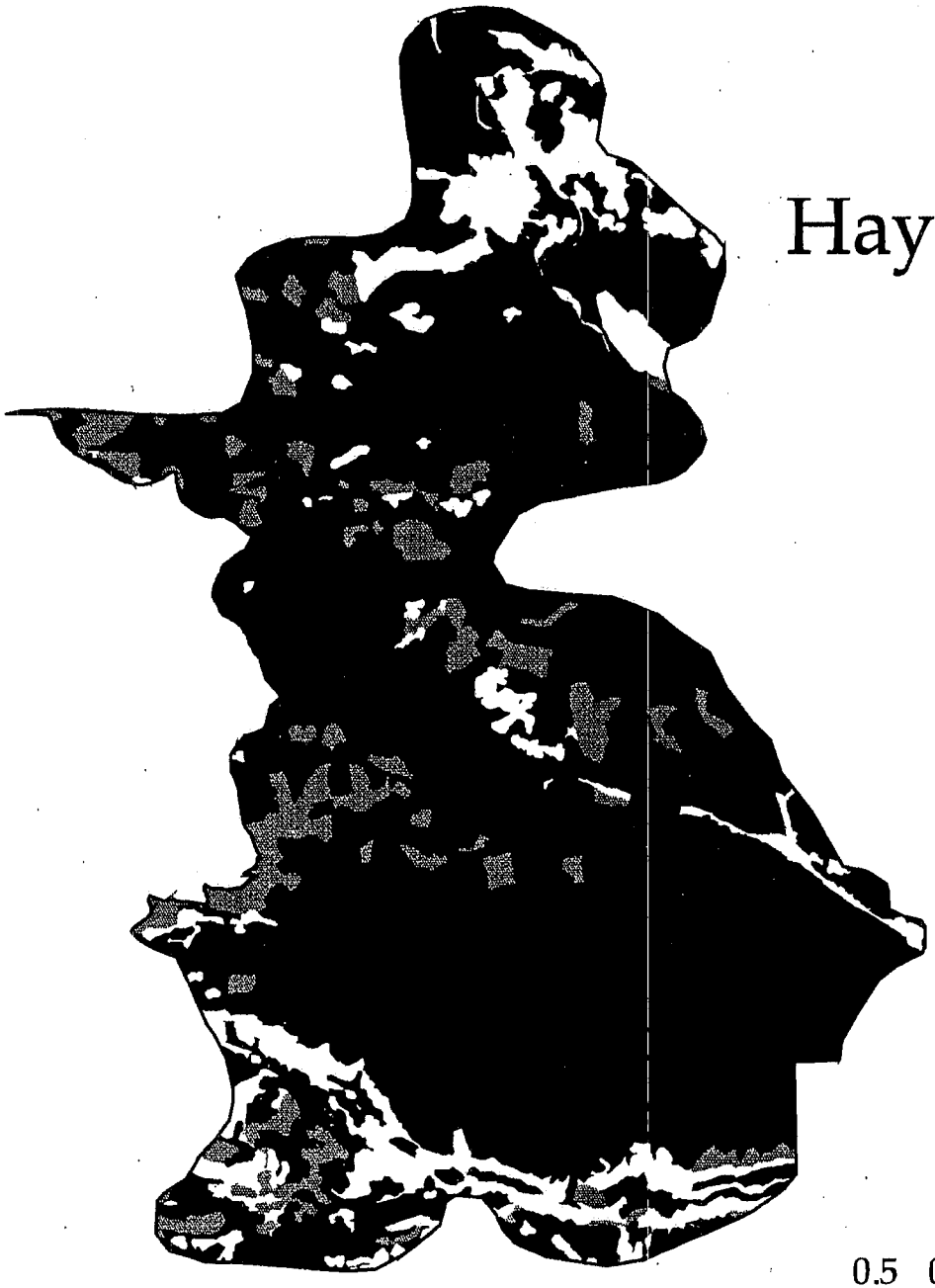


Haystack LSR

Composite Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles

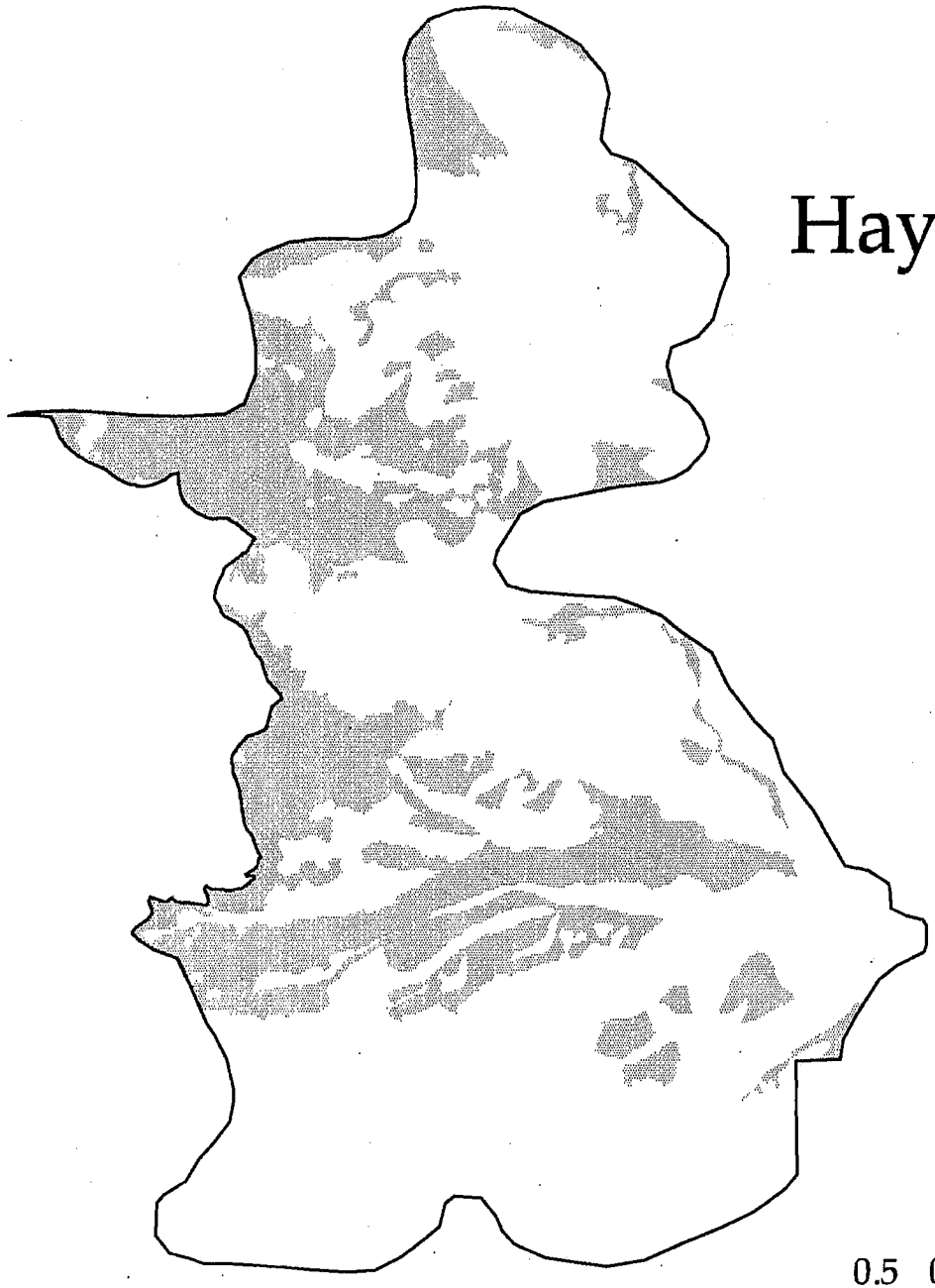


Haystack LSR

Fire Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles

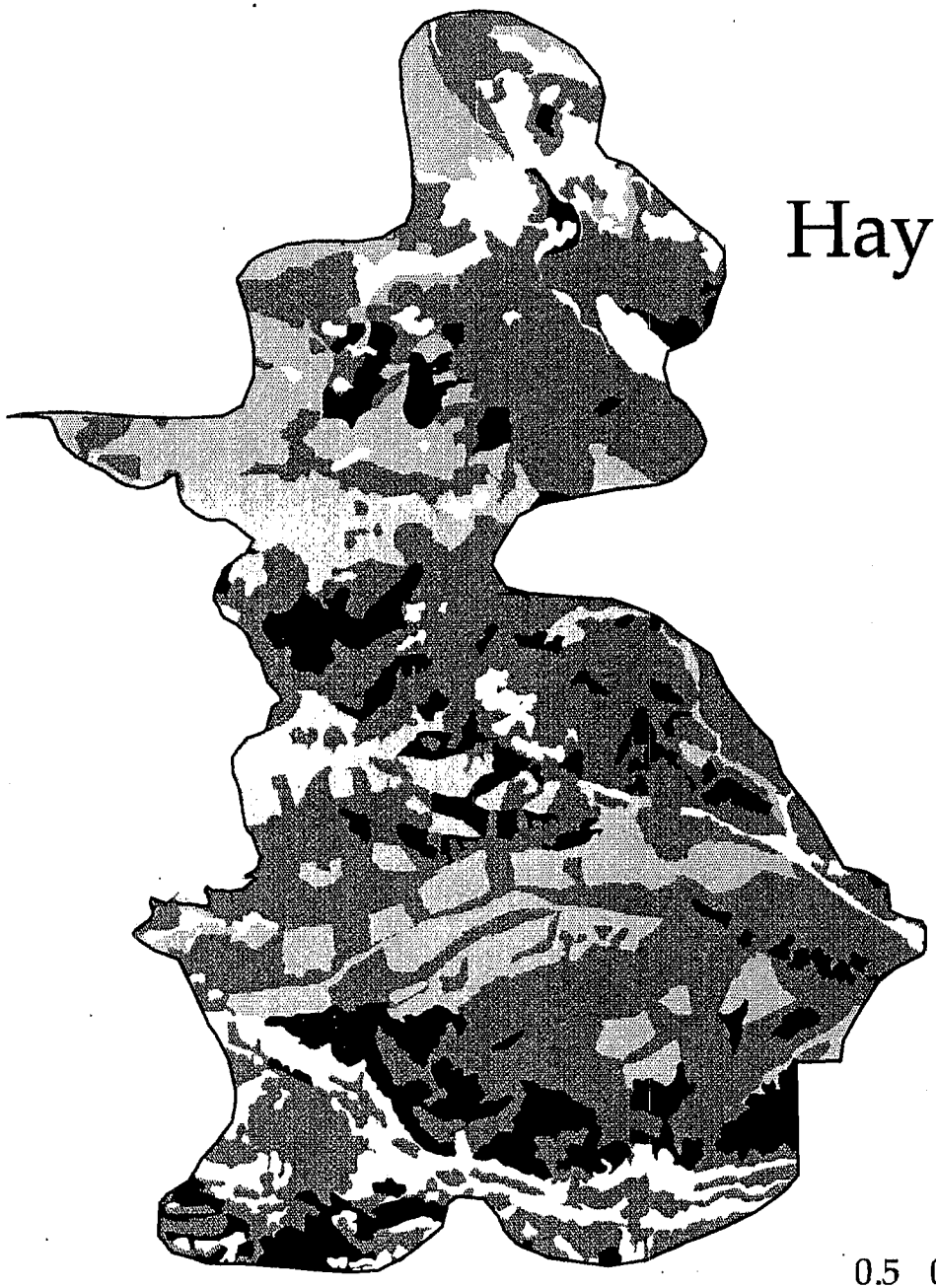


Haystack LSR

Dwarf Mistletoe TSHE
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles

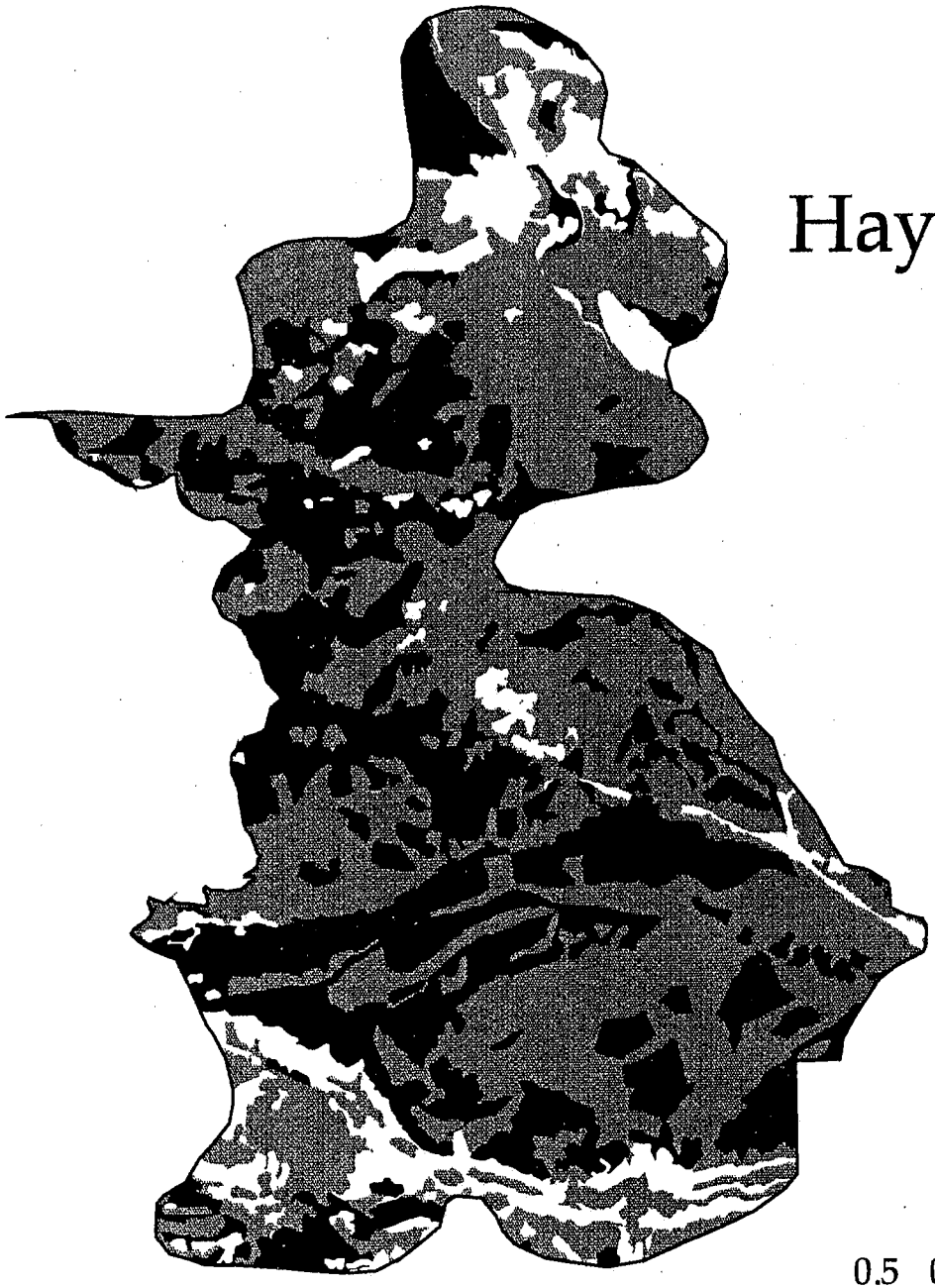


Haystack LSR

Root Rot AROS
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles



Haystack LSR

Root Rot HEAN
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

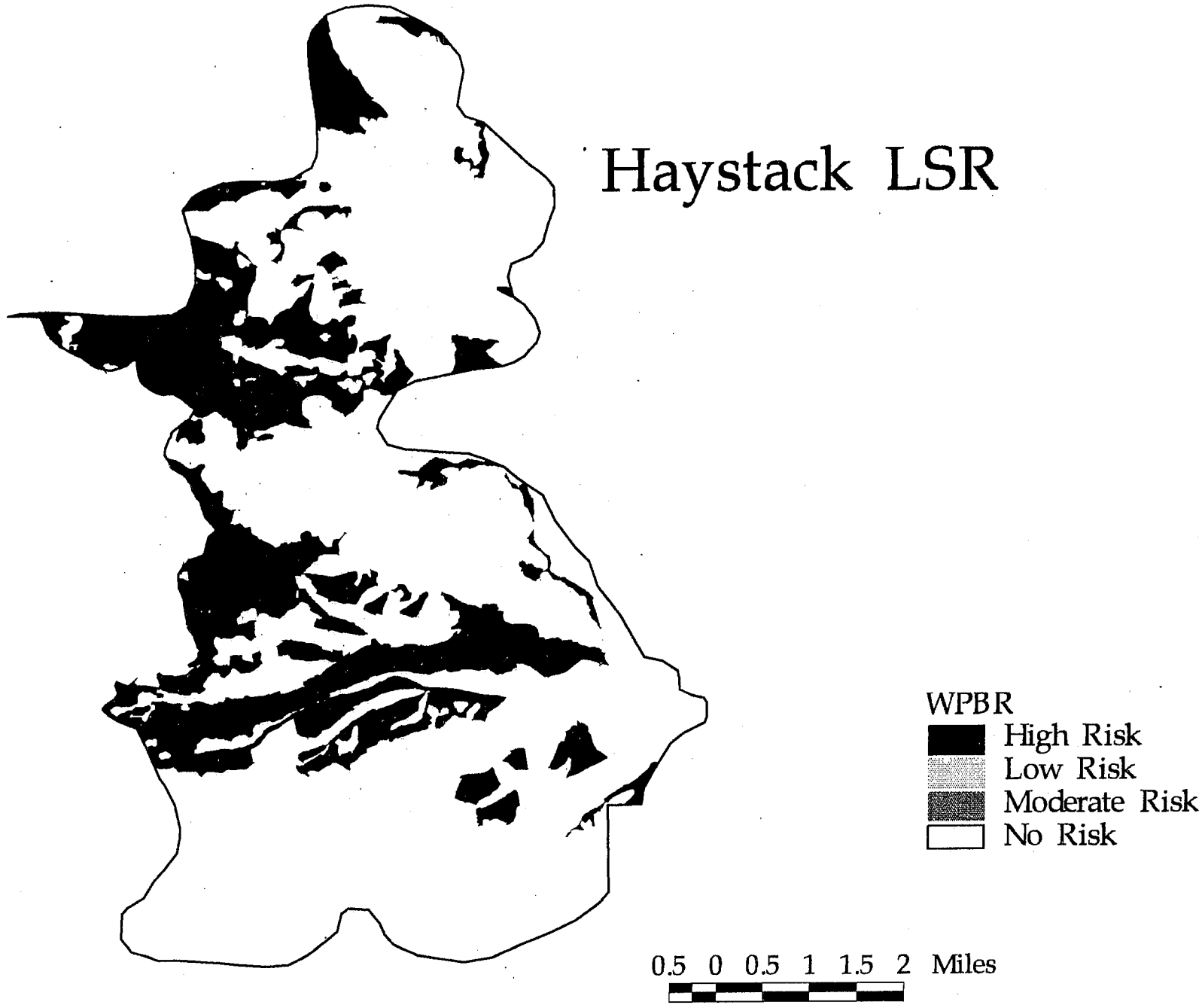
0.5 0 0.5 1 1.5 2 Miles

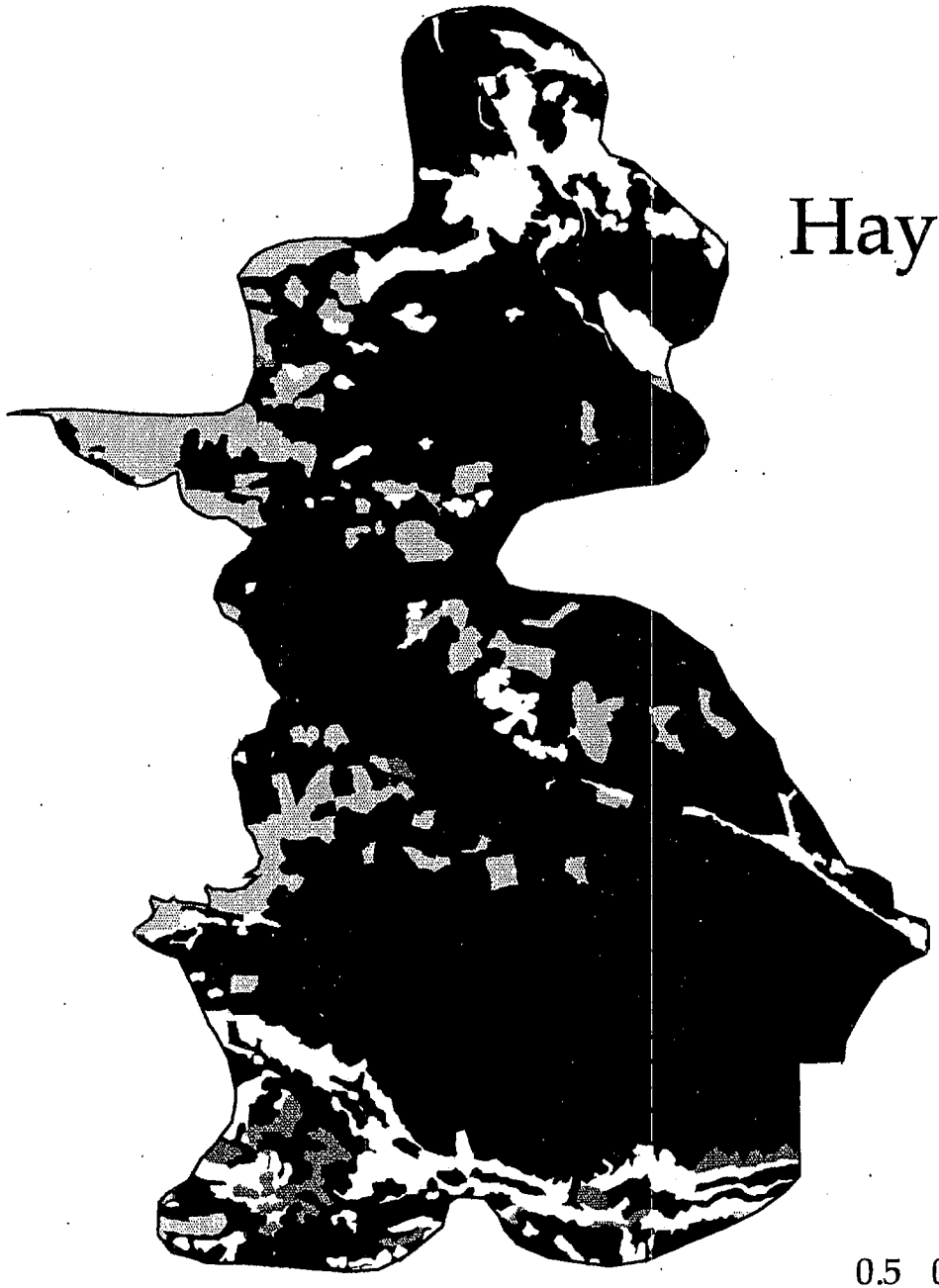
Haystack LSR

PHWE
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles


Haystack LSR
WPBR
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.5 0 0.5 1 1.5 2 Miles

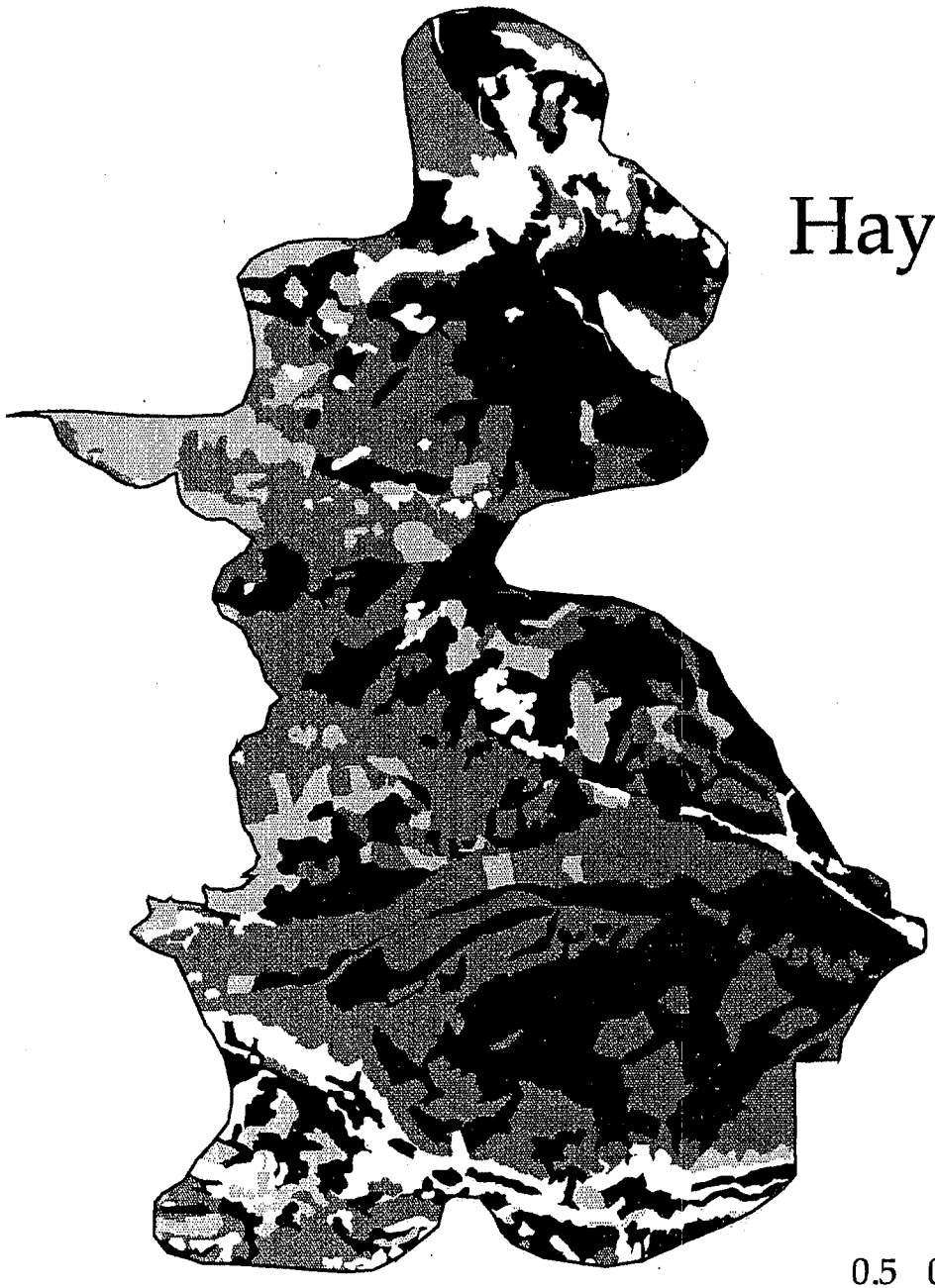


Haystack LSR

WSB
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles



Haystack LSR

DFB
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles

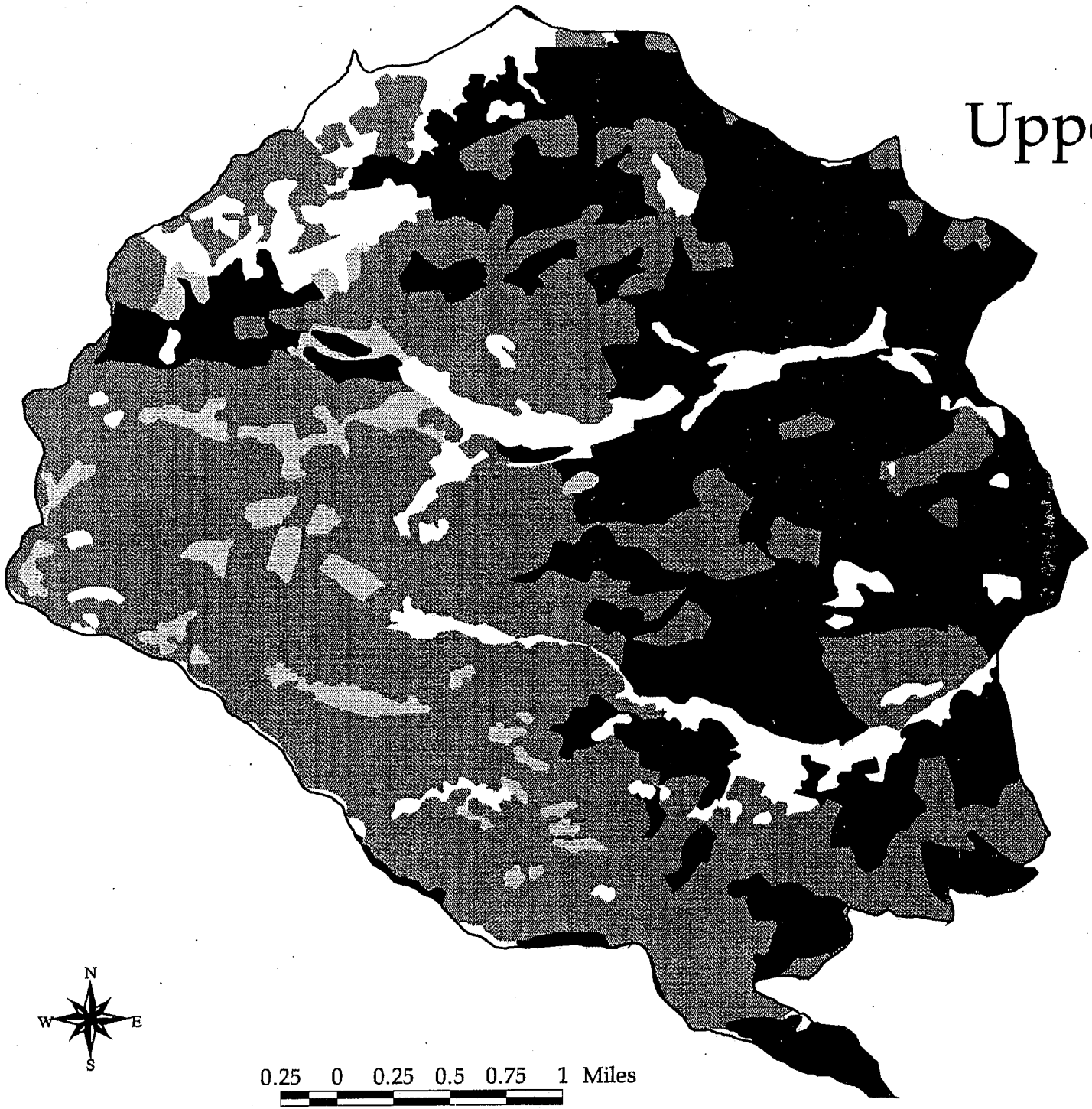
Haystack LSR

Fir Engraver
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.5 0 0.5 1 1.5 2 Miles

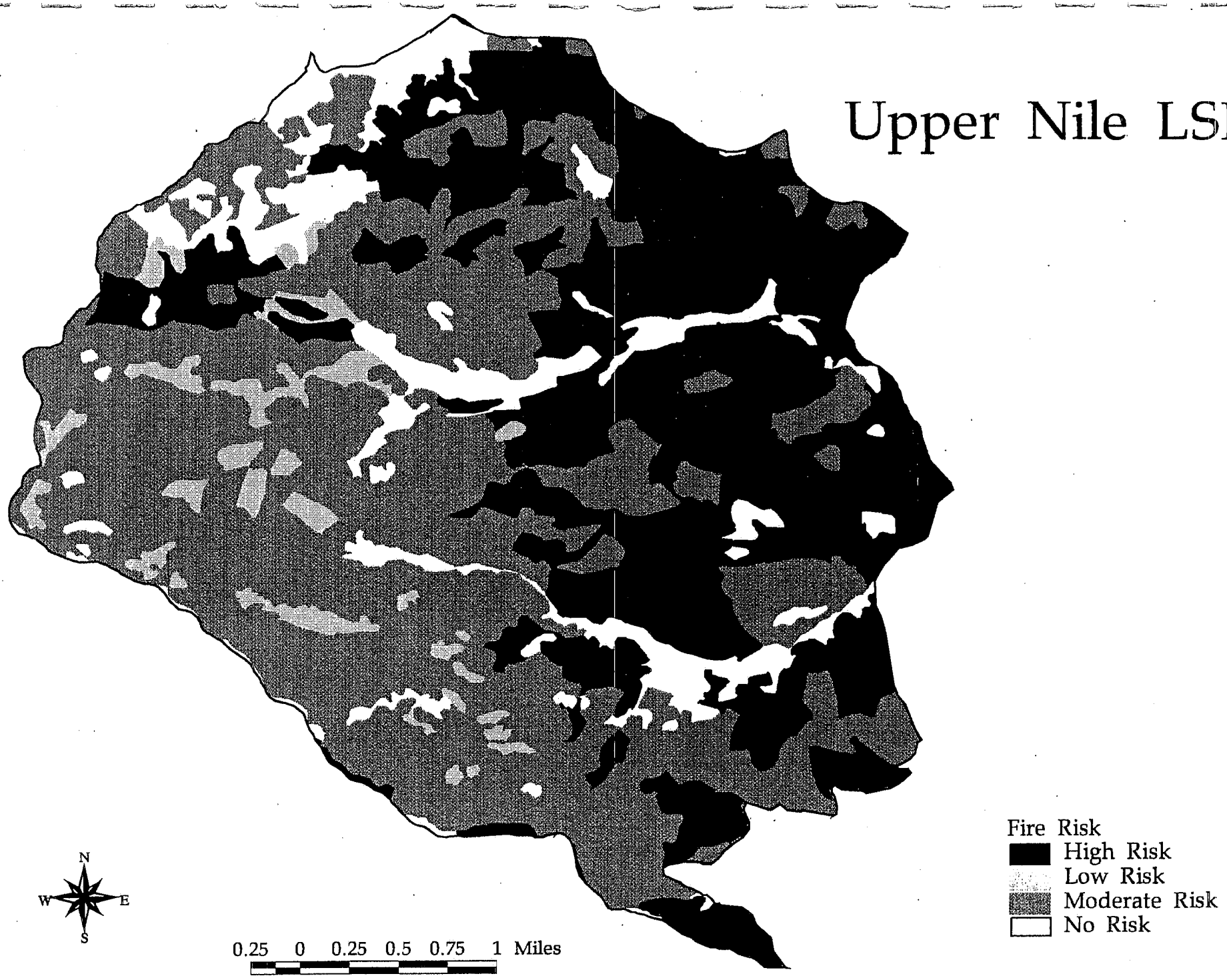
Upper Nile LSR

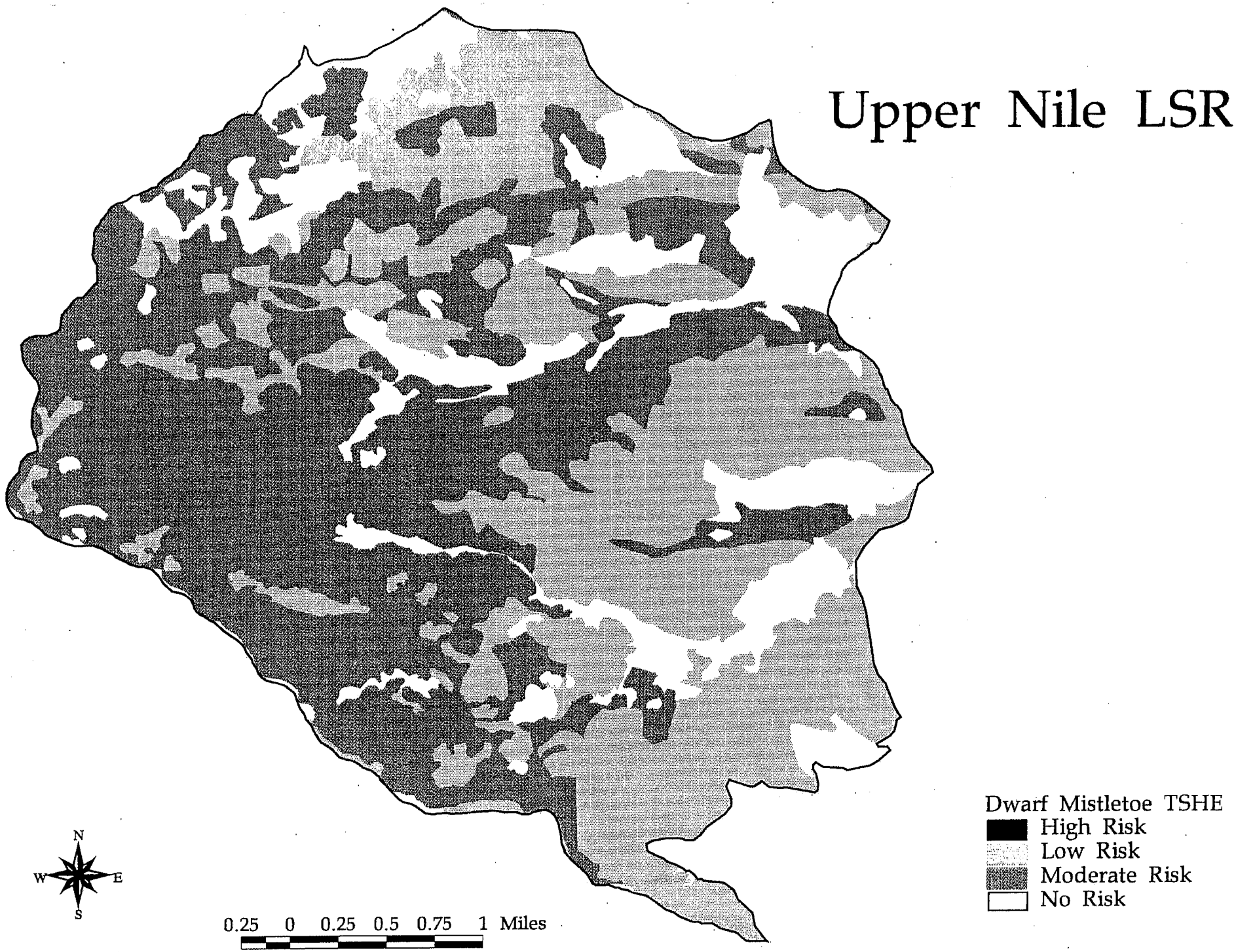


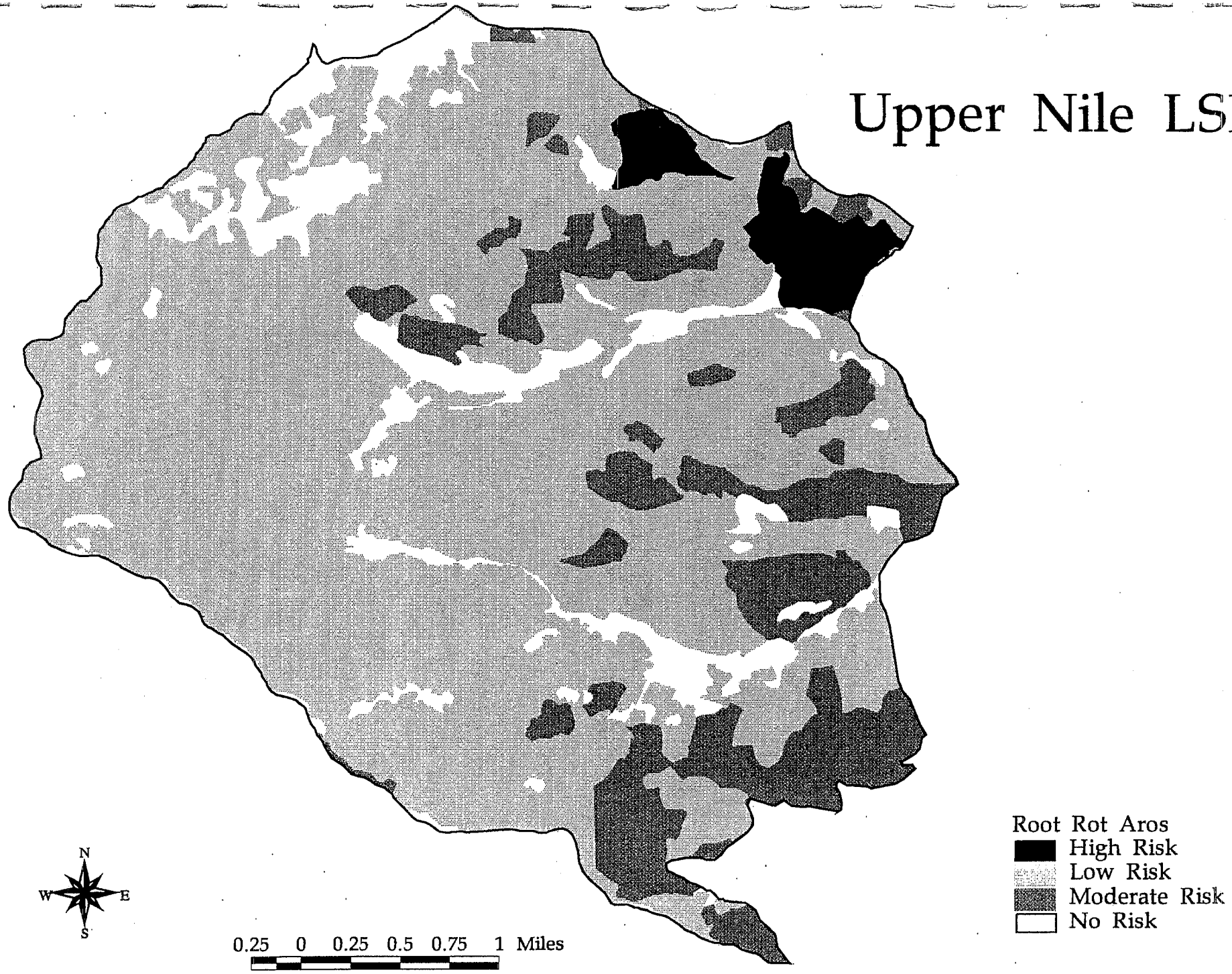
N
W E
S

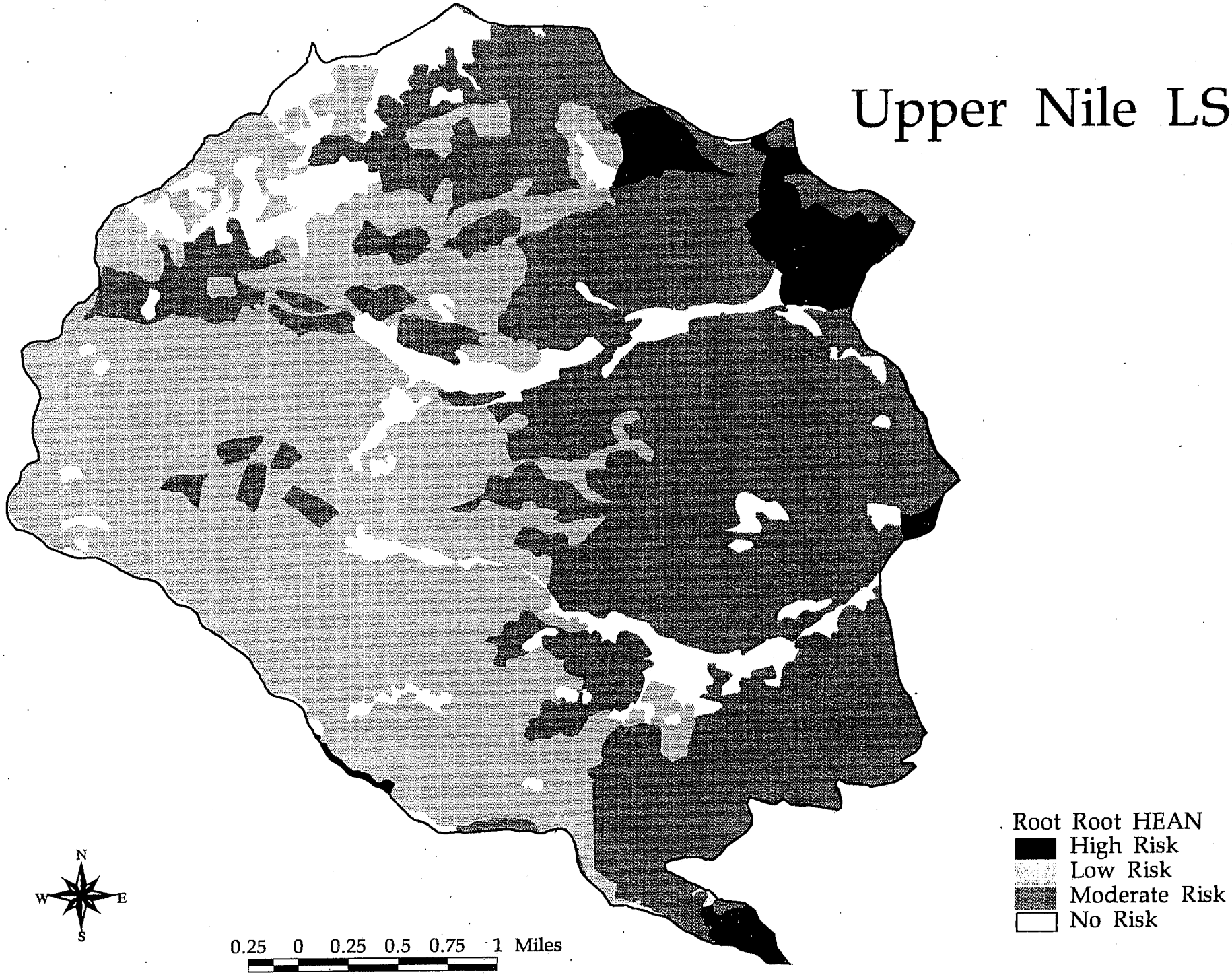
0.25 0 0.25 0.5 0.75 1 Miles

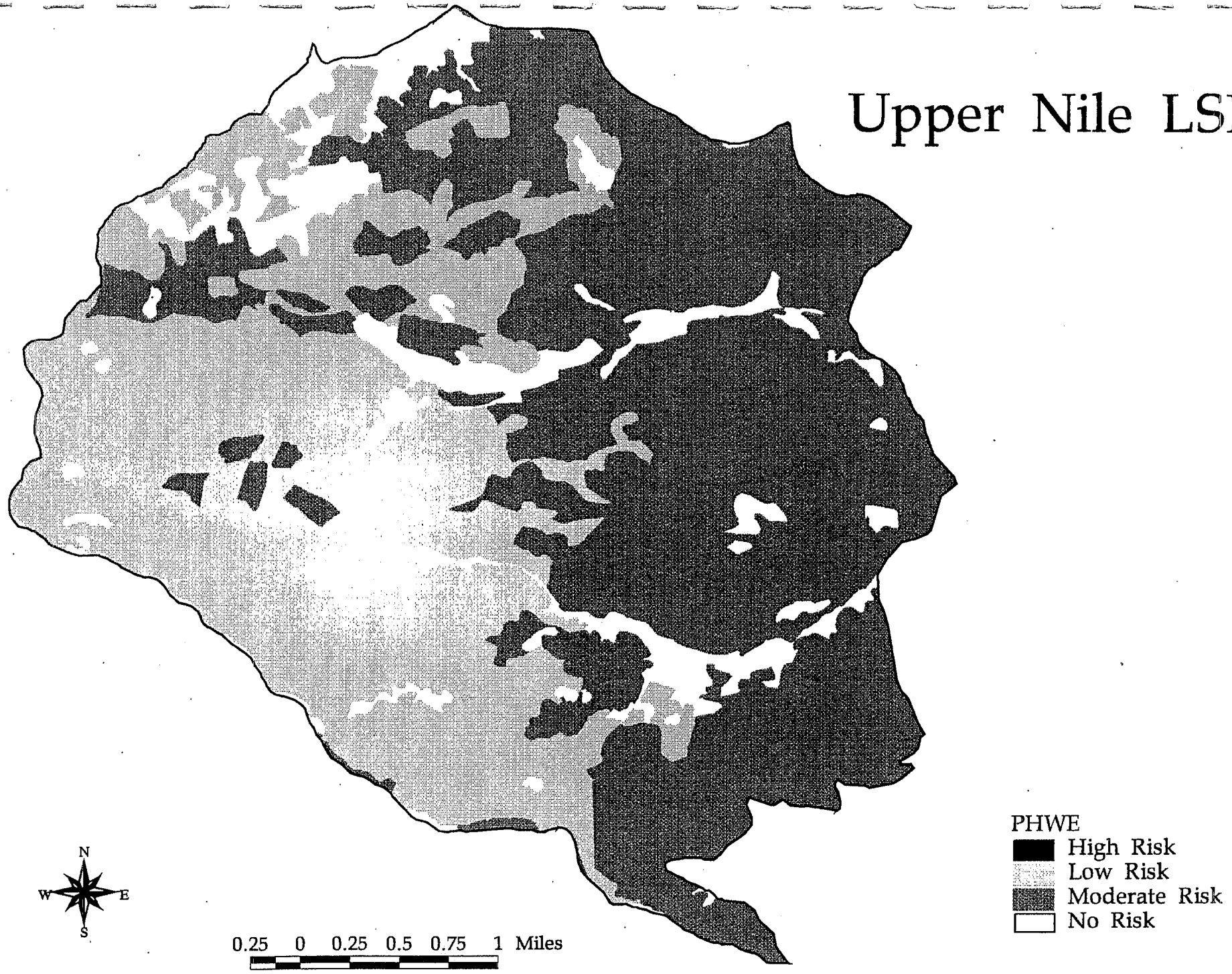
Composite Risk
- High Risk
- Low Risk
- Moderate Risk
- No Risk


Upper Nile LSR
Fire Risk
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles

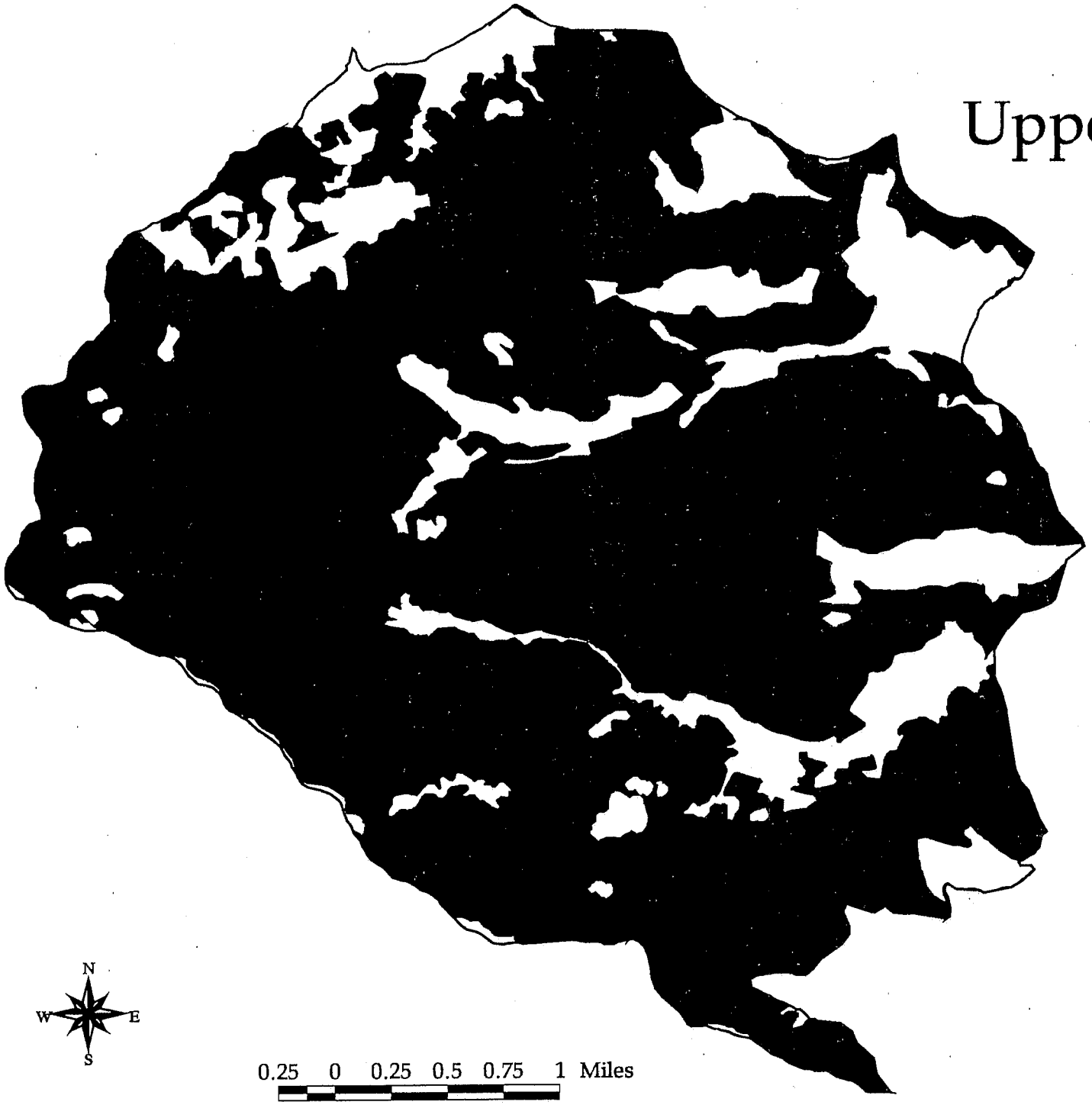

Upper Nile LSR
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles
Dwarf Mistletoe TSHE
High Risk
Low Risk
Moderate Risk
No Risk


Upper Nile LSR
Root Rot Aros
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles


Upper Nile LSR
Root Root HEAN
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles


Upper Nile LSR
PHWE
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles

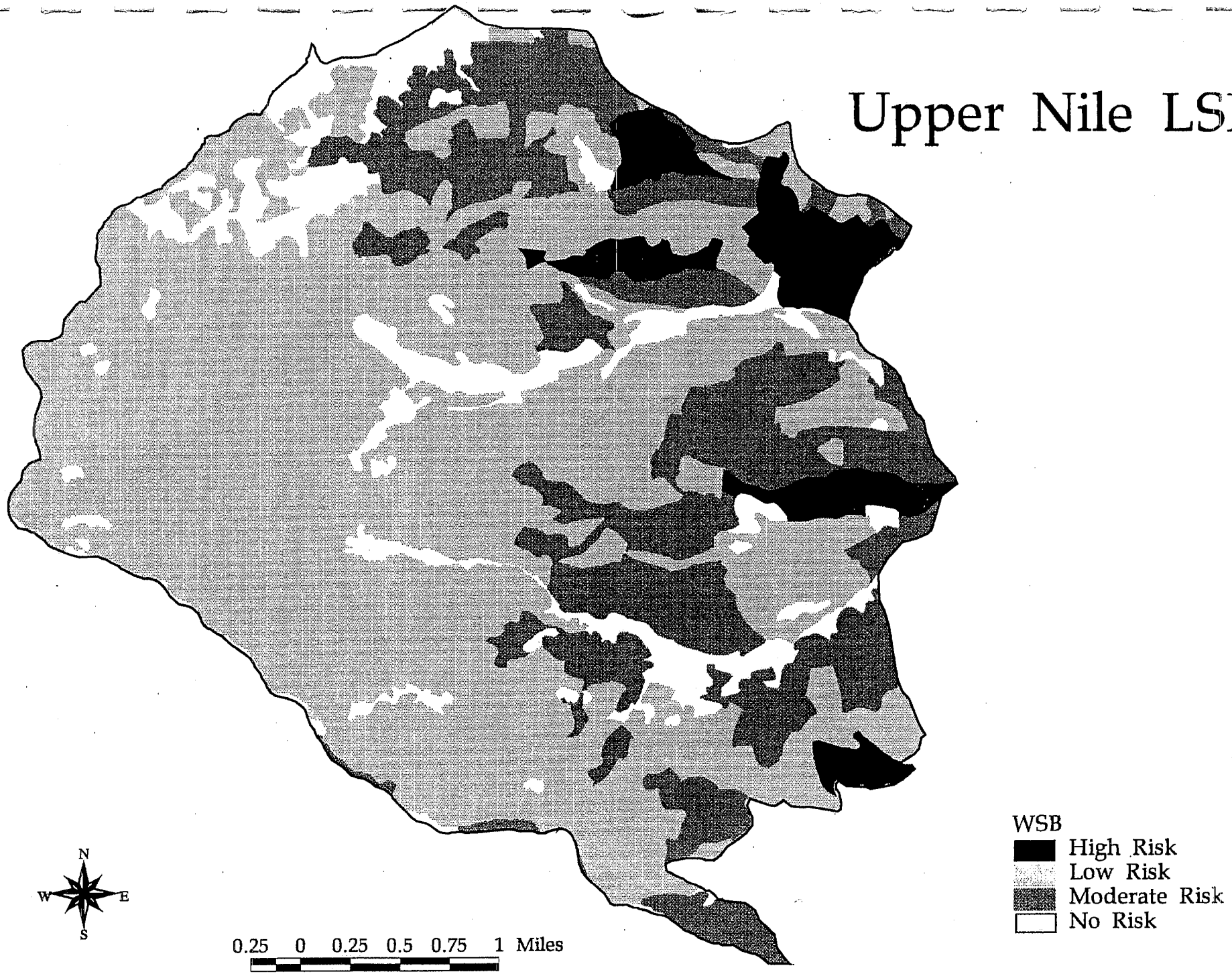
Upper Nile LSR

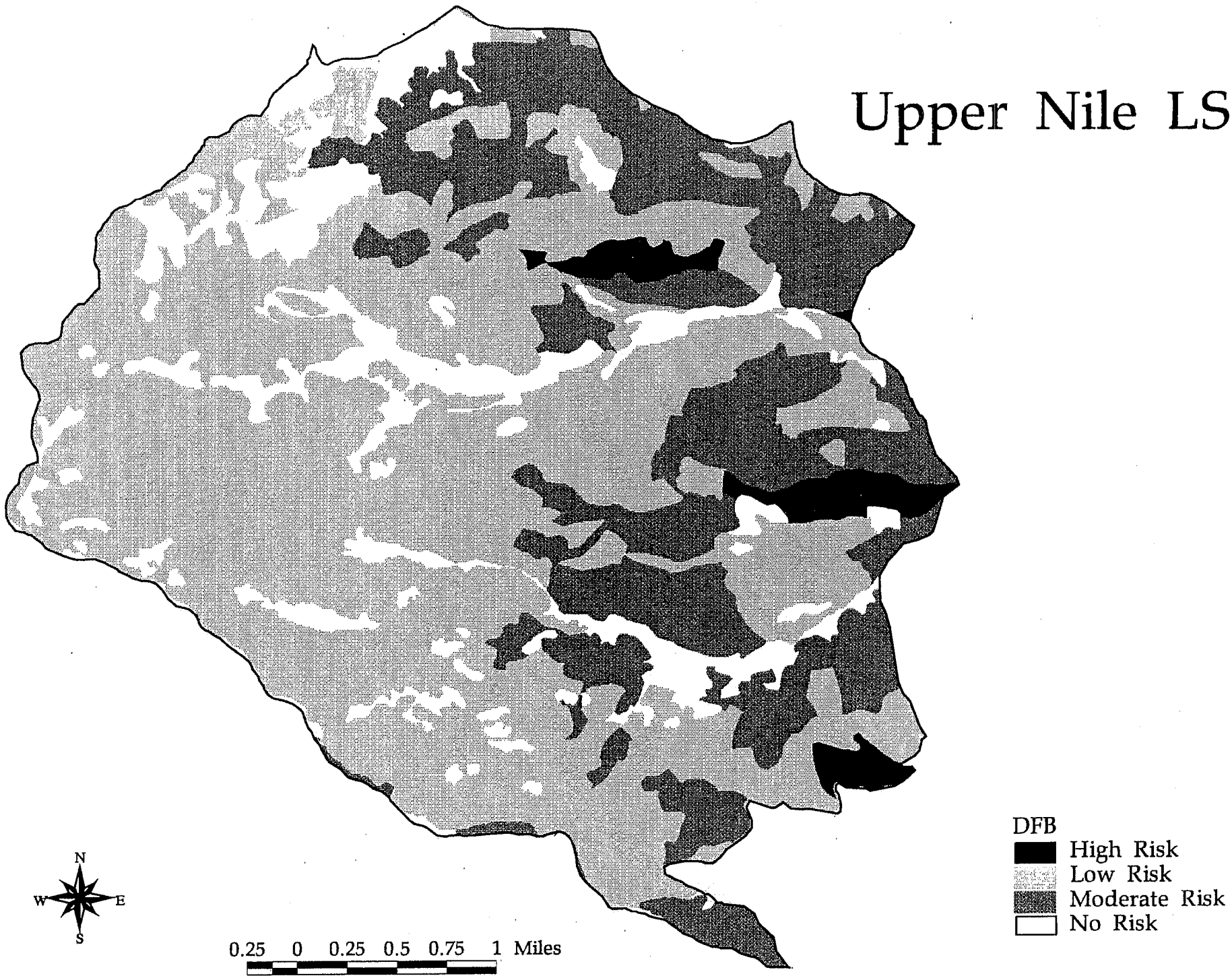


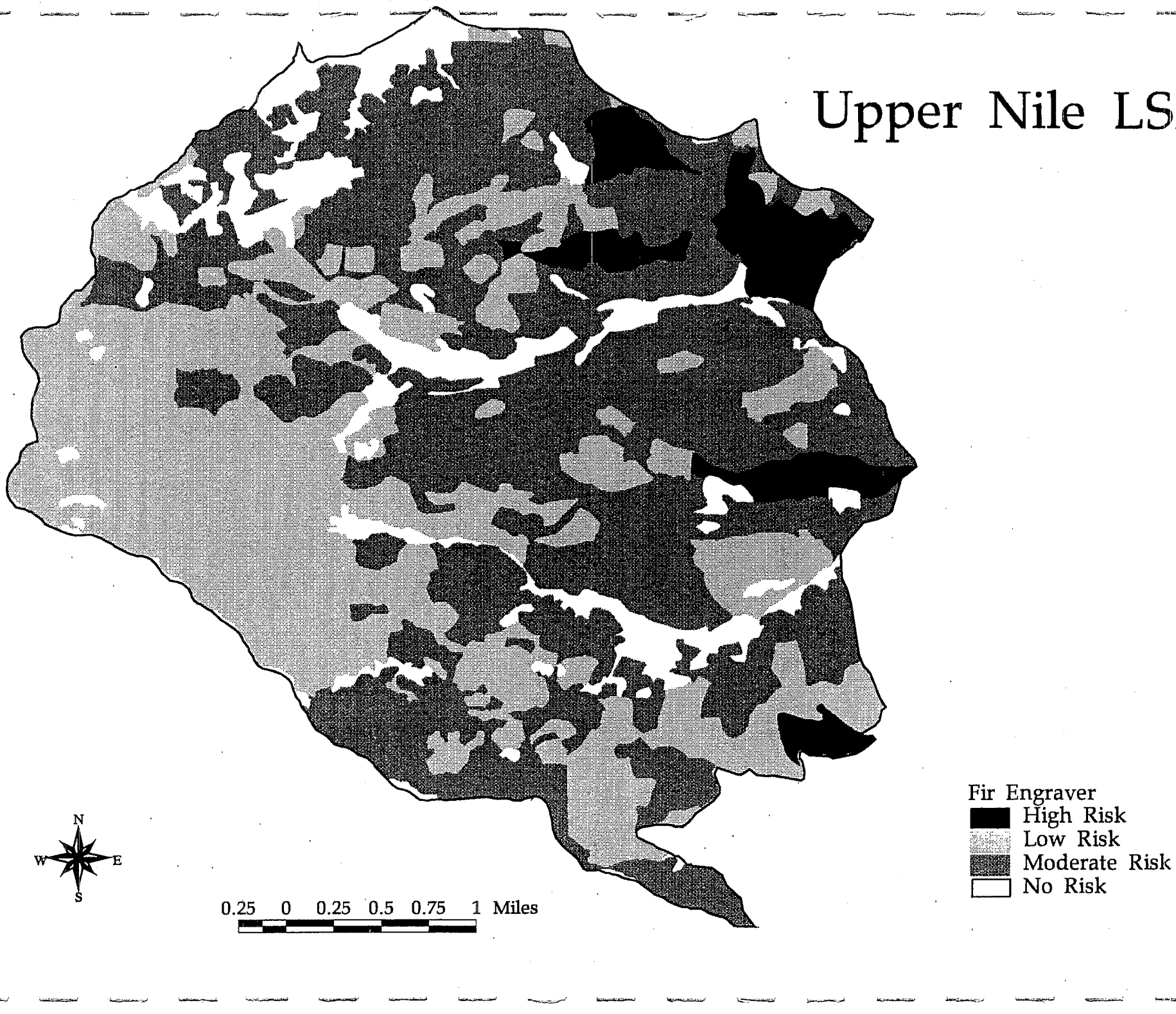
WPBR
- High Risk
- Low Risk
- Moderate Risk
- No Risk

N
W E
S

0.25 0 0.25 0.5 0.75 1 Miles


Upper Nile LSR
WSB
High Risk
Low Risk
Moderate Risk
No Risk
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles


Upper Nile LSR
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles
DFB
High Risk
Low Risk
Moderate Risk
No Risk


Upper Nile LSR
N
W
E
S
0.25 0 0.25 0.5 0.75 1 Miles
Fir Engraver
High Risk
Low Risk
Moderate Risk
No Risk